

# Service Manual

## ViewSonic 15G

Model No. 1569GA

*15" Digital Controlled Color Monitor  
Graphics Series*



(Rev. 1 - July 1998)

ViewSonic® 20480 E. Business Parkway, Walnut, California 91789 USA - (800) 888-8888

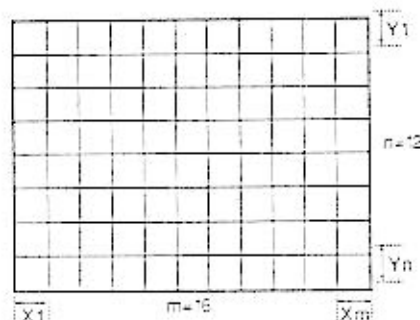
### 5.6.4 Linearity

#### Horizontal linearity

$$= \frac{X_{\max} - X_{\min}}{X_{\max} + X_{\min}} \times 100\% \leq 7\%$$

#### Vertical linearity

$$= \frac{Y_{\max} - Y_{\min}}{Y_{\max} + Y_{\min}} \times 100\% \leq 6\%$$



#### Conditions

Display image—crosshatch pattern

Maximum and minimum values should not be adjacent to each other.

X max. is maximum value among X1-Xm

X min. is minimum value among X1-Xm

Y max. is maximum value among Y1-Yn

Y min. is minimum value among Y1-Yn

### 5.7 General performance

#### 5.7.1 Video output

Bandwidth	86 MHz (Typ)
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Picture is readable 90MHz dot frequency signal.

#### 5.7.2 Maximum luminance

Value	120 cd/m <sup>2</sup> (min.) at the center of the display area. Specified by 9300K + 27 MPCD
Conditions	Display image: White full flat field Luminance: Min. (Contrast: Max.) (Brightness: Center)

#### 5.7.3 Minimum luminance

Value	≤ 25 cd/m <sup>2</sup> at the center of the display area. Specified by 9300 K + 27 MPCD
Conditions	Display image: White full flat field Luminance: Min. (Contrast: Min.) (Brightness: Center)

### 5.7.4 Brightness variation

Value	55%(Min.) Variation = C/A × 100
Conditions	Display image: White full flat field Luminance: 110 cd/m <sup>2</sup> at center of the display area. A: Luminance at the center position C: Luminance at position of lowest brightness

### 5.7.5 Display area regulation

	Display area variation	Range of variation
Due to Luminance	Within 1.5% of display area	26~120CD/m <sup>2</sup> (White flat field)
Due to Power supply	Within 1.5% of display area	AC: 90-132V or 198-254V
Due to Temperature	Within 2.0% of display area	0-35°C Meet 40°C

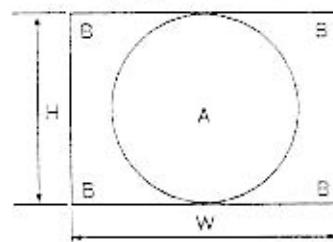
### 5.7.6 Color Point

Value	※ 9300K + 27MPCD (x=0.281±0.020, y=0.311±0.020)
Conditions	Display image: White flat field at the center of the display area. Luminance: 26~120 cd/m <sup>2</sup>

### 5.7.7 Misconvergence

Center area of display (A) :0.3 mm (Max.)

Center area of display (B) :0.4 mm (Max.)



#### Conditions:

Display image: Crosshatch pattern mixed with R, G and B colors.

Convergence gauge: KLEIN CM7AG or equivalent  
W×H: 260×195 mm

### 5.7.8 Purity

Conspicuous mislanding shall not be visible within display area at a distance of 60cm from the CRT surface.

#### Conditions:

Display image: White flat field

Luminance: 80 cd/m<sup>2</sup> at the center of display area.

### 5.7.9 Jitter

Less than 1 dot, or invisible at a distance of 60cm from CRT surface.

## 5.7.10 Audio

### Electric Characteristics

	Item	Condition	Specification		
			Min.	Typ.	Max.
Line Input	Line input signal level	f: 1kHz		0.8Vrms	2.0Vrms
	Line input impedance			24k $\Omega$	
Audio-SP	Maximum Power Output (Electric)	f: 1kHz, THD: 1%	1W+1W	2W+2W	
	Signal to Noise Ratio	f: 1kHz with 20kHz Low Pass filter		50dB	
	Cross Talk	f: 1kHz		50dB	
	Distortion	f: 1kHz, Output: 1W			1%
		f: 1kHz, Output: 2W			10%
	Response Characteristics	THD: 1% Output: 1W 0dB at 1kHz	100Hz	+6dB	
			10KHz	-6dB	
Headphone	Maximum Electric Power Output	f: 1kHz THD: 1%, R <sub>o</sub> : 32 $\Omega$	5mW	4mW	
	Distortion	f: 1kHz Output: 2mW R <sub>o</sub> : 32 $\Omega$			1%
Mic	Microphone Sensitivity	f: 1kHz, P <sub>in</sub> = 1Pa (0dB=1V/Pa)		-43dB	

## 6. POWER MANAGEMENT FOR POWER SAVING

Power saving system is designed upon based VESA DPMS standard

(Proposal: 1.0p, Revision: 0.7p)

Power consumption and recovery time

*1 APM state				MONITOR POWER CONSUMPTION	RECOVERY TIME TO ON STATE	INDICATOR
	H. Sync	V. Sync	VIDEO			
ON	*3 NORMAL	*3 NORMAL	*2 ACTIVE	*4 100 %	-----	Green
STAND-BY	No Sync or *5 < 5 KHz	> 40 Hz	*6 BLANK	< 30 W	< 4 s	Yellow
SUSPEND	> 10 KHz	No Sync or *5 < 20 Hz	*6 BLANK	< 30 W	< 4 s	Yellow
OFF	No Sync or *5 < 5 KHz	No Sync or *5 < 20 Hz	*6 BLANK	< 8 W	< 20 s	Yellow

\* The transition time from ON state to each APM state is 5 seconds.

\*1: APM: Advanced Power Management.

\*2: Measure condition of power consumption for ON state

— DISPLAY IMAGE: White full "H" characters with a border line (7X 9 dots)

\*3: Normal: See page 5 "Acceptable timing"

\*4: Power consumption is measure at AC100-240V.

\*5: Power saving operation is done at least less than specified value in the list.

\*6: VIDEO BLANK: "BLANK" includes "no set up signal" and "no sync signal" on Video Signal.

## 7. ENVIRONMENTS

7.1 Ambient temperature, humidity and altitude

	Operating	Storage and Shipment
Temperature	0°C ~40°C (32~104°F)	-20°C ~60°C (-4~140°F)
Humidity	5~90% *	5~90% *
Altitude	3,000 m (Max.) (10,000 ft)	12,000 m (Max.) (40,000 ft)

\*Non-condensation

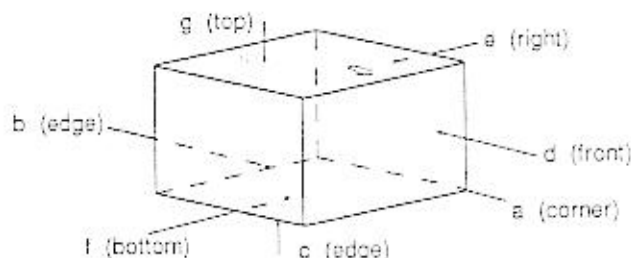
## 7.2 Vibration and shock

### (1) Vibration

	Order of tests	Direction of vibration		Acceleration		Frequency	Sweep	Test time
				Non-Operation	Storage and shipment			
Unpacked	1	Vertical	Up to down	2.9 m/s <sup>2</sup> (0.3 G)		5-55 Hz	120 S	30 min.
	2	Horizontal	Front to back					15 min.
	3		Right to left					
Packed	1	Vertical	Up to down		9.8 m/s <sup>2</sup> (1.0 G)	5-50 Hz	810 S (Log - sweep)	40 min.
	2	Horizontal	Front to back		4.9 m/s <sup>2</sup> (0.5 G)			20 min.
	3		Right to left		(1G=9.80665 m/s <sup>2</sup> )			

### (2) Shock (Drop test)

Unpacked	20 G One time for each face (6 faces) (non-operation)			
Packed	Order of drop	Face to drop is to face the floor, (see the figure)	Height	Number of drop
	1 Corner, 3 Edge, 6 Face		61 cm	1 time for each



## 8. REGULATORY STANDARDS

### 8.1 Safety standards, Applicable standards

UL1950, Listing,  
CSA 22.2 No. 950, Products Certification  
TUV (EN50950/GS(ZH/618), NORDIC  
DHHS, 21 CFR Subchapter J, X-Ray Radiation  
PTB, X-Ray Radiation, Self Declaration, HWC

### 8.2 EMC standards

Designed to meet the following standards  
VCCI class 2  
FCC part 15, subject B, class B  
VDE 0878 class B, MPR-II Radiation  
CISPR22 class B, TCO-92

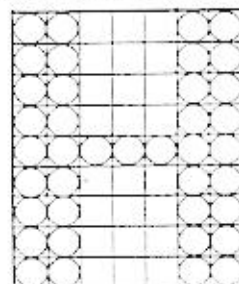
### 8.3 CABLE

- 1) Signal cable with Min. D-Sub 15P connector (VIDEO CABLE) Length: 1.5 meter (4.93 feet)
- 2) Audio cable: Dual RCA jack (male) - Stereo mini jack (male) Length: 1.5 meter (4.93 feet)
- 3) Microphone cable: Stereo mini jack (male) Length: 1.5 meter (4.93 feet)

Available from  
'95 June Production

<EMI test pattern>

White, full "H" characters (7 X 9 dots), block (5 X 16 dots) "H" character font is as follows:





## DIMENSIONS

### Dimensions:

Width : 14.7"(374mm)

Height : 15.1"(383mm)

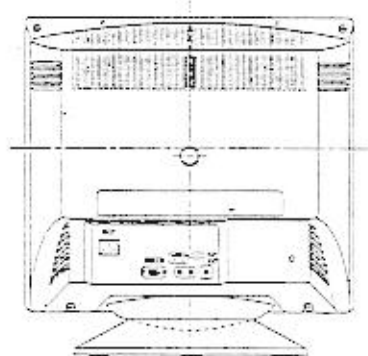
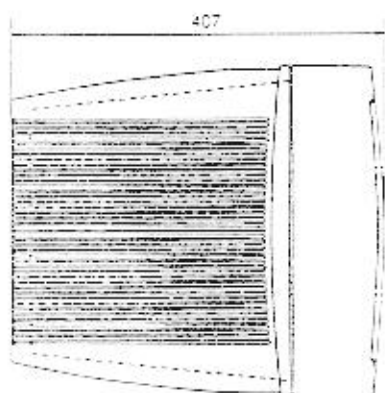
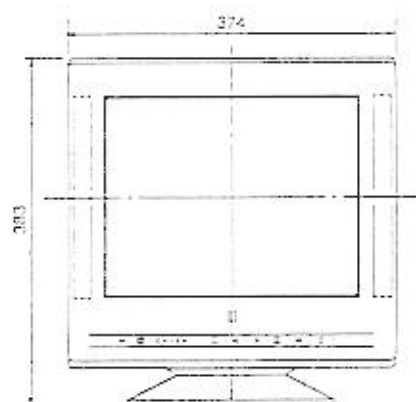
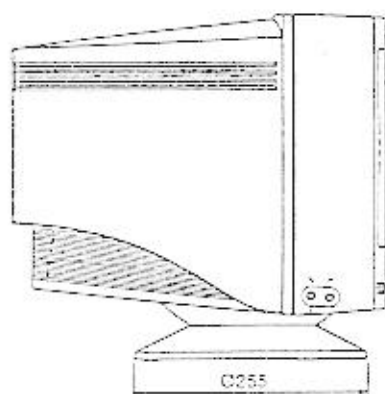
Depth : 16.0"(407mm)

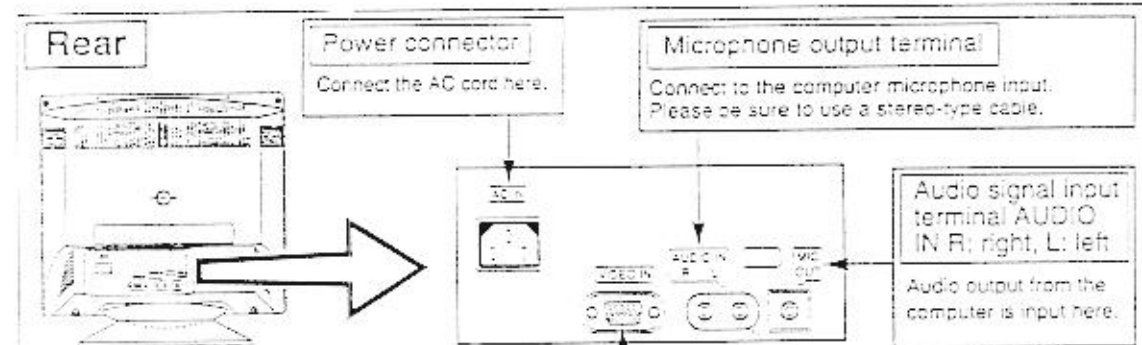
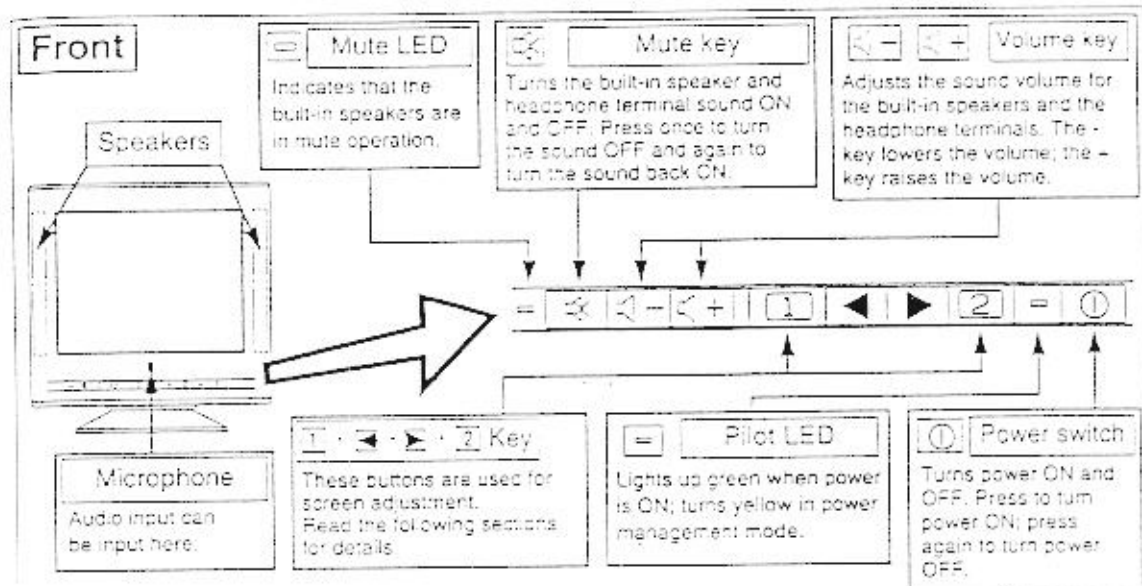
### Pan/Tilt range

Up : 13 degrees

Down : 4 degrees

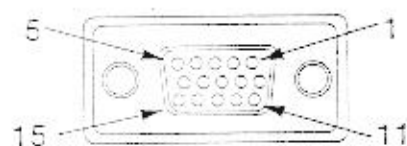
Left, right : 90 degrees each





**Mini D-sub 15-pin signal connector**  
Connect the display signal cable here.

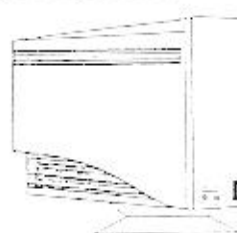
The roles of the pins are given in the table at right.



Pin No.	Signal name	Pin No.	Signal name
1	red signal	9	Not used
2	green signal	10	ground
3	blue signal	11	ground
4	ground	12	SDA (DDC)*
5	ground (DDC)*	13	horizontal synchronization signal
6	red signal ground	14	vertical synchronization signal
7	green signal ground	15	SCL (DDC)*
8	blue signal ground		

\* VESA DDC standard.

**Left side**



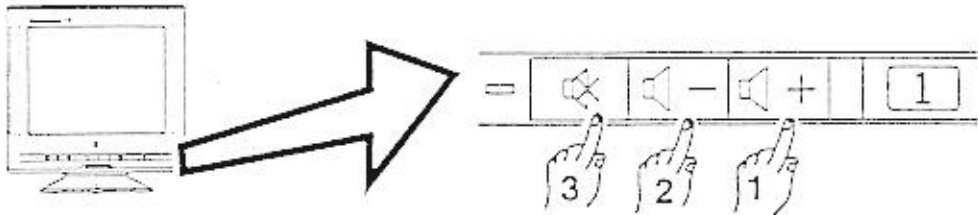
**Headphone terminal**

Commercially available audio stereo headphones or speakers can be connected here.

**Microphone terminal <MIC IN>**

Connect an external microphone here.

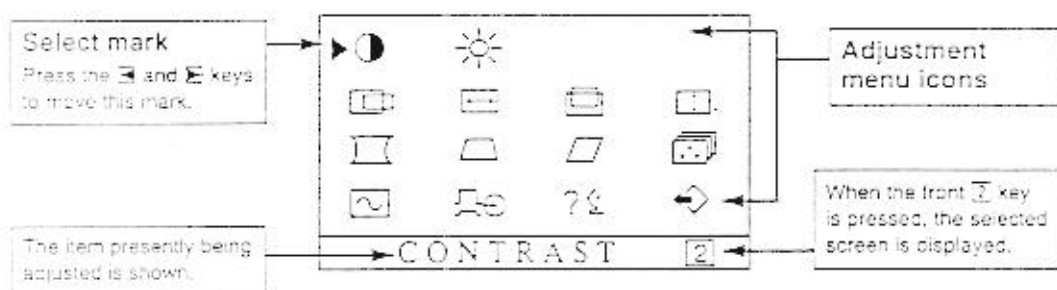
## Speaker operation



1	VOLUME 80	When the  key is pressed, the volume is raised.
2	VOLUME 50	When the  key is pressed, the volume is lowered.
3	VOLUME MUTE	When the  key is pressed, the volume is muted.

## On-Screen Display

### 1) Menu screen



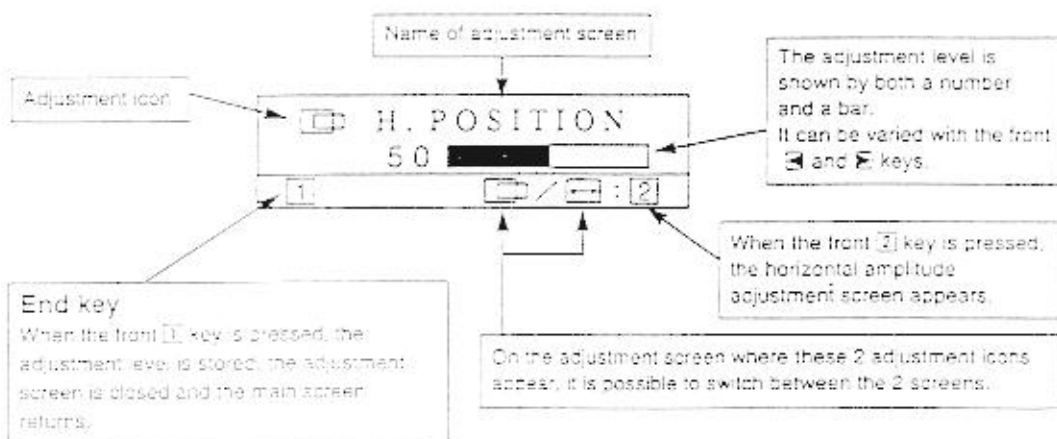
Select mark  
Press the [Left] and [Right] keys to move this mark.

The item presently being adjusted is shown.

Adjustment menu icons

When the front [2] key is pressed, the selected screen is displayed.

### 2) Adjustment screen (example: horizontal position adjustment)



Name of adjustment screen

Adjustment icon

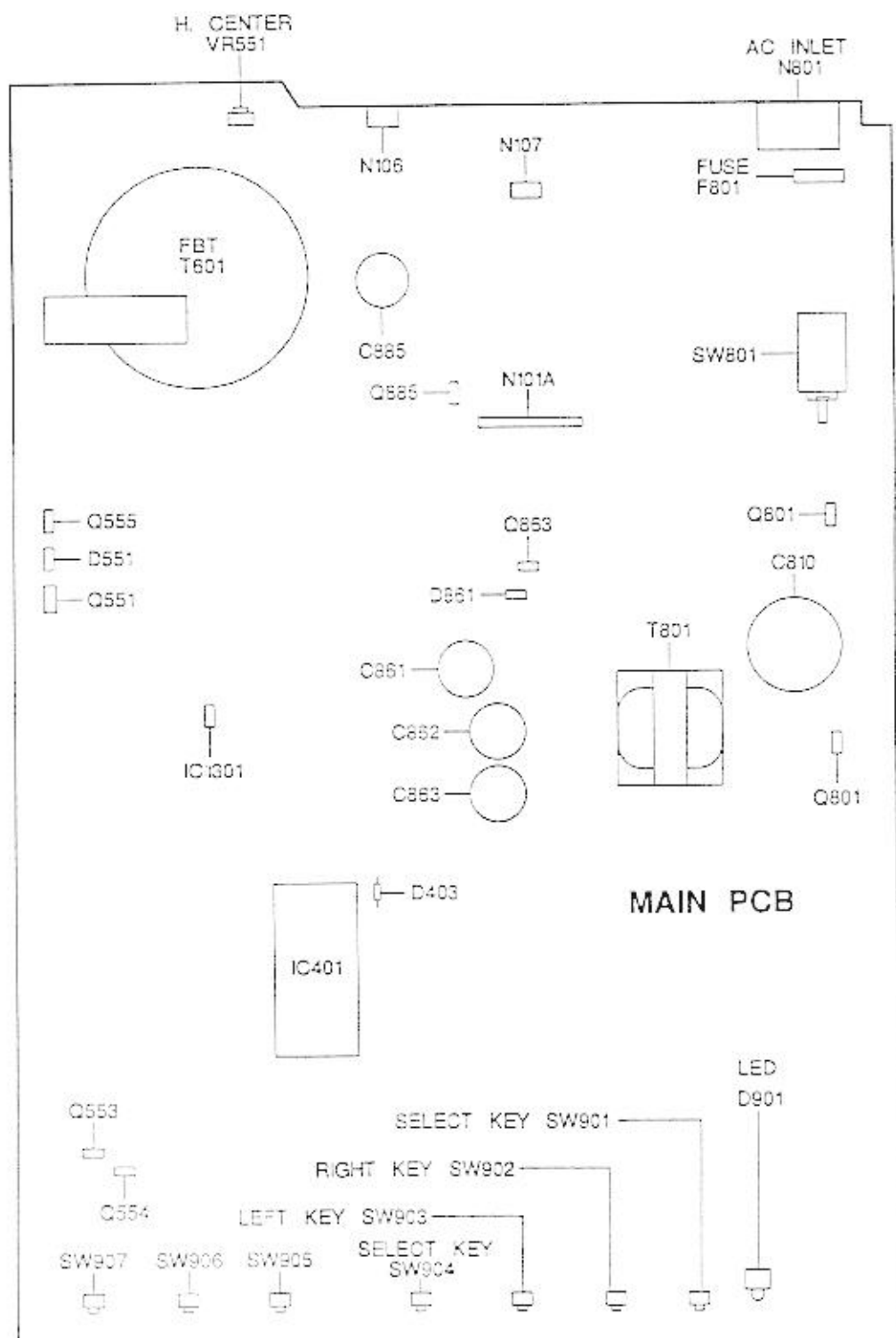
The adjustment level is shown by both a number and a bar. It can be varied with the front [Left] and [Right] keys.

When the front [2] key is pressed, the horizontal amplitude adjustment screen appears.

On the adjustment screen where these 2 adjustment icons appear, it is possible to switch between the 2 screens.

End key  
When the front [1] key is pressed, the adjustment level is stored, the adjustment screen is closed and the main screen returns.

# SERVICE ADJUSTMENT CONTROL LOCATION



1. Degaussing is inevitably required during purity or convergence adjustments.
2. If you check or adjust electrical specification or function, a minimum of 20 minutes burn-in is required.
3. Reforming of the leadwire is required after your repair work.
4. Prior to starting work, be sure to check that the input signal is at the specified timing and that the polarity is as specified in all modes.
5. Brightness control: After mounting the rear cover, brightness tend to decrease about 5 cd/m<sup>2</sup> on a flat white field and about 1 cd/m<sup>2</sup> on a white raster field. This should be taken into consideration.
6. Brightness stabilizing time: It takes about 20 to 50 seconds for the brightness to stabilize after turning the power off for 5 seconds (AC).
7. Aging should be performed in white raster of 30~50 cd/m<sup>2</sup> and raster size of 280 X 210 mm before adjusting the ITC.
8. Contrast: When both CONTRAST switches (UP and DOWN SW) are simultaneously pressed, the contrast increases to a maximum.
9. Brightness: When both BRIGHT switches (UP and DOWNSW) are simultaneously pressed, the brightness lights at the center point.

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## CAUTION FOR SERVICING

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When servicing or replacing the CRT, high voltage sometimes remains on the anode. Completely discharge high voltage before servicing or replacing the CRT to prevent a shock hazard.

### CRT Anode Discharge

1. When you check the CRT anode or replace the CRT, discharge the CRT anode to the external conductive coating (aquadag) of the CRT, especially when checking directly right after power turn-off.
2. Ground one end of a jumper wire that has a 100 M $\Omega$  resistor (30 kV < resisting pressure 100M $\Omega$  ) and connect the other end to the CRT anode.

*NOTE: Grounding must be done first.*

### Power Supply

This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

1. Do not touch the HOT section and the COLD section at the same time. You may receive an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and COLD section at the same time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.

## INTRODUCTION

- This monitor is controlled by microcomputer. With the exception of purity/convergence/focus all is digitally adjusted. Therefore a computer, the dedicated control software, the dedicated interface, a 9~12V power supply, and a signal generator are required servicing.

## TOOLS REQUIRED

- Computer**  
The control software is IBM PC compatible only. Therefore it is not compatible with any other operating systems. For further information please contact 1-800-888-8583.
- Control Software**  
The 1569GA-1 chassis can only use "1569GA-1 \* adjustment program disk". No other program can access the EEPROM on the monitor.

## Interface

The interface is dedicated to work only with the control software and the 1569GA-1. There are no substitutes for this interface.

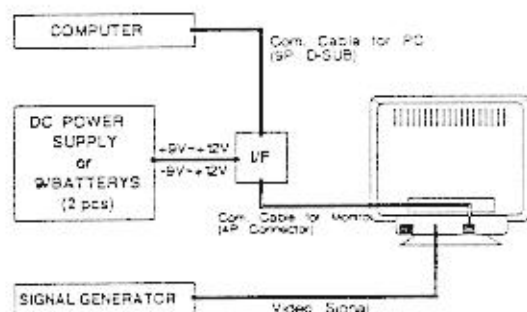
## Power Supply

A DC 9~12V (+9~12V/-9~12V) power supply is required for operating the interface.

## Signal Generator

It is necessary for you to use a signal generator which operates on fH=60 KHz, fV=160 Hz, and f0 86 MHz bands.

## INTERFACE CONNECTION



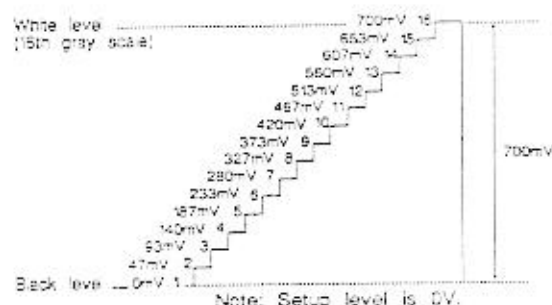
## OTHER TOOLS

- Oscilloscope (dual trace)
- Scope probe - Attenuation: 100:1  
Attenuation: 10:1
- Digital Voltmeter - Range: 0 to 1000V DC  
Accuracy: 0.1%
- TV color Analyzer II - that reads luminance and chromaticity X and Y coordinates.
- Digital High Voltmeter
- AC power supply - Output voltage: 0 to 300V
- Degaussing coil
- Convergence meter
- Scale
- Double-faced scale
- Microscope - Scale factor: 50
- Screwdriver - Tip width: 1/10" (2.5 mm)  
One with extremely narrow tip-end  
Length: 6" (15 cm)
- Screwdriver - Cross recessed head  
Length: 14" (35 cm)
- Tool-for hexagon socket set screw of Deflection Yoke
- White lacquer (Paint)

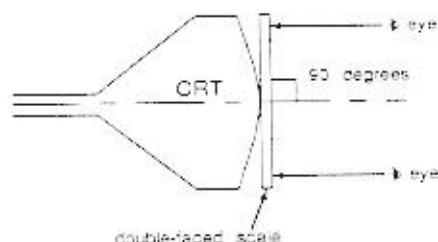
## STANDARD CONDITION OF ADJUSTMENT PROCEDURE

- Signal timing: Standard timing 1024 X 768 (See page 5)
- Display pattern: White, full "H" character
- Signal level: V/H: TTL level video: 700mV
- Input source: AC 120V, 50/60 Hz
- Ambient temperature: Room temperature
- Warm-up time: More than 30 minutes
- Brightness control: Center
- Contrast control: Max.
- Magnetic field: Vertical: -M: 50 uT, -E: 40 uT,  
-A: 45 uT
- Signal cable: Horizontal: 0 uT  
Attached

Video input signal from PC.



- Use a Helmholtz device to adjust a unit with no horizontal magnetic field and a vertical field of 40 uT.
- Inspect the unit under the same conditions.
- The ambient illuminance must be 200 lux.
- Use an external degaussing coil any time the DEGAUSS switch does not remove color shanding. To check the image width, height, linearity and distortion, proceed as below.



Measure level with respect to tube axis.

## 1. Software operating procedure

- 1) Power on the computer.
- 2) Connect the Communication cable for monitor adjustment.
- 3) Insert the adjustment disk into the drive.
- 4) At the A>prompt type ADJ, then press [ENTER].
- 5) Refer to the adjustment procedures.

## 2. Adjustment Program

### Main Menu of Adjustment Program

<<1569GA-I ADJUST PROGRAM MAIN MENU>> (a:exit) (Ver 1.5)	
1) Load data from FILE	6) Save data to FILE
2) Adjust VSR setting	7) Change EEPROM data
3) Adjust DISTORTION	8) Special ADJUST
4) Adjust Factory preset	9) Information Service
5) Clear User preset	10) Show Version & Error


### Description of Function of Each Menu

- 1) Load Data from File:  
This transfers the data file from the disc to the EEPROM on the monitor.
- 2) Adjust VSR Setting:  
To guarantee the full range of horizontal frequencies operate correctly. The reference voltage and the distortion offset data should be set.
- 3) Adjust Distortion:  
To make adjustments of any geometric distortion. (I.E. Trapezoid or Parallelogram)
- 4) Adjust Factory Preset:  
Makes adjustments to the factory presets. This data is also referenced when in modes other than the preset mode.
- 5) Clear User Preset:  
Clears the data written in the user preset domain. There is no data in the user presets when the product shipped from the factory.
- 6) Save Data to File:  
Transfers the data from the EEPROM on the monitor to a data file on a floppy disk or hard drive. The data file can be named anything as long as it is less than 8 characters long.
- 7) Change EEPROM data:  
Allows the data in the EEPROM to be changed.
- 8) Special ADJUST:  
This menu item has three separate functions.
  - A) Adjustment: There are two items of adjustment, DAF, and V. Lin(C).  
The Dynamic Astigmatic Focus (DAF) and the Vertical Linearity need to be set for correct operation.
  - B) Data calculation: There are three items of data calculation, Video 1.0pp, Color Adjust, and H. Size Limit. All these calculations are done automatically by the software.
  - C) Final Tune: This compares the non-adjustable data of the EEPROM with the non-adjustable data on the disk. If differences are found the EEPROM should be revised.
- 9) Information Service:  
Displays the H/V frequencies that is being supplied to the monitor and gives the operational status of the monitor.
- 10) Show Version and Error:  
Shows the version of the microprocessor that is in the monitor. Also, if there is an error in the operation of the monitor. The error is displayed on the screen of the PC.



# ADJUSTMENT PROCEDURE WITH COMPUTER


## 1. Description of Adjustment Method

Item Program Menu	◇ Test Motor ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
A DATA SETTING  1) Load data from FILE	▼ C664 (+)GND	A1 A2 A3  A4	OFF	Turn the power on, but do not connect the signal cable. Press  by setting the cell to the menu at left. A message FILE -> EEPROM FILE NAME (G or Q escape) is displayed. So, key in the <b>T7EF-1K.DAT</b> (when using the standard data) and press . Note : To make the transferred data effective, turn the power of the monitor set off once and turn it on once again.  Only load standard data when the main board or the EEPROM is replaced.	
B X-RAY Protection	▼ D403 (+)GND	B1 B2 B3	-1	Add +6V to the test point. The monitor will shut down. Turn OFF and then turn ON the power, the monitor will be operated normally.	
C Voltage adjust (H out+B adjust)	◇ Digital voltmeter ▼ TP1-GND □ Crosshatch	C1	-1 2 3 4	Adjust VR801 until the 24V of test point at the right is resulted.  1:18.5V ± 0.5V 2:264.0V ± 0.5V 3:114.0V ± 0.5V 4:155.5V ± 0.7V	24.0 ± 0.5V
D H-Deflection Voltage  2) Adjust VSR setting	◇ Digital voltmeter  ▼ C551 (+)GND  □ Video OFF	D1 D2  D3 D4  D5  D6 D7 D8 D9	-1   -2 -3 -4	Set the cell to the menu at left and press the . Set the cell to the adjusting mode [INTP[0]] and press the . Check to be sure that the input signal to the monitor is [IH 29.5kHz] and [IV 48.0Hz] and press the . Set the cell to <u>H OUT B</u> and press the . Then, move the cell to the data side. Make adjustment to as shown at right using  and . Make registration using the  after adjustment and press the  to the menu of D2. «The same as D2, D3, D4 and D5 after setting the adjusting mode/signal and adjustment. Adjusting mode INTP[1]: Input signal [IH 39.0kHz][IV 77.1Hz] Adjusting mode INTP[2]: Input signal [IH 54.0kHz][IV 105.0Hz] Adjusting mode INTP[3]: Input signal [IH 69.9kHz][IV 165.0Hz] Return to the main menu by pressing the .	 1200 ± 10V  1220 ± 10V 1240 ± 10V 1260 ± 10V
E Pattern Stability	□ Blinking	E1	-1	Adjust VR552 to find the best point of the Blinking pattern.	△ H × 2 mm
F FOCUS	□ Character pattern	F1 F2 F3	-4	Turn the FOCUS VR of the PBT to make the focus of the peripheral section optimum. (Note: This adjustment should be done by turning the VR using a screwdriver.)	

Note 1: Check to be sure that the program disc name is "T9GA" before making necessary adjustment.

Note 2: Unless otherwise specified, the monitor set state is as given at the right.

Note 3: The underlined places indicate the adjustment items on the screen of the PC.

Item Program Menu	<input type="checkbox"/> Test Meter <input type="checkbox"/> Test Point <input type="checkbox"/> Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
G H.CENTER	<input type="checkbox"/> RGB OFF (Sync signal only)		-4	Adjust VR551 to get A = B	<div style="display: flex; justify-content: space-between; align-items: center;"> <span>A</span> <span>A-B</span> <span>B</span> </div>  <p>Set the RASTER to the center with respect to the bezel.   A - B   ≤ 2 mm</p>
I HV.SIZE, HV.POSI, V.PCC (2)	<input type="checkbox"/> Crosshatch	I1 I2 I3 I4 I5 I6 I7 I8 IE	-1 -2 -3 -4	<p>Set the cell to the menu at left and press the [F].</p> <p>Set the cell to the adjusting mode <u>INTP[0]</u> and press the [F].</p> <p>Check to be sure that the input signal to the monitor is [H 29.5kHz] and [V 48.0Hz] and Press the [F].</p> <p>Set the cell to the following items, press the [F], and make necessary adjustment using the [←] and [→].</p> <p>① <u>H.SIZE</u>, ② <u>V.SIZE</u>, ③ <u>H.POSI</u>, ④ <u>V.POSI</u>, and ⑤ <u>V.PCC</u></p> <p>After adjusting ① - ⑤, press the [F] and return to the menu of I2.</p> <p>&lt;Same as I2, I3, I4 and I5 except for the adjusting mode/signal.&gt;</p> <p>I6 -2 Adjusting mode <u>INTP[1]</u>: Input signal [H 39.0kHz][V 77.1Hz]</p> <p>I7 -3 Adjusting mode <u>INTP[2]</u>: Input signal [H 54.0kHz][V 105.0Hz]</p> <p>I8 -4 Adjusting mode <u>INTP[3]</u>: Input signal [H 64.5kHz][V 165.0Hz]</p> <p>Press [F] to return to the main menu.</p>	H.SIZE 260 ± 4mm V.SIZE 195 ± 4mm HV.POSI CENTER V.PCC best point
J HV.SIZE/HV.POSI/V.PCC (3)	<input type="checkbox"/> Crosshatch	J1 J2 J3 J4 JE	MODE-43	<p>Set the cell to the menu at left and press the [F].</p> <p>Check to be sure that the input signal is shown at left and press the [F].</p> <p>&lt;Set the cell to the following items, press the [F], and make J3 and J4.&gt;</p> <p>Adjust the <u>H.SIZE</u>, <u>V.SIZE</u>, <u>H.POSI</u> and <u>V.POSI</u> to the left using [←] and [→].</p> <p>Set the <u>V.PCC</u>, <u>V.PCC TRAPEZOID</u> and <u>V.PCC PARALLEL</u> to the best using [←] and [→].</p> <p>Press the [F] and [N] to return to the main menu.</p>	H.SIZE 260 ± 4mm V.SIZE 195 ± 4mm HV.POSI/CENTER
K V.PCC	<input type="checkbox"/> Crosshatch	K1 K2 KE	MODE-43	<p>Check to be sure that the input signal as shown at left.</p> <p>Set the cell to the menu at left and press the [F].</p> <p>&lt;Set the cell to the following items, press the [F], and make necessary adjustment.&gt;</p> <p>Set the <u>V.PCC CORNER</u>, <u>V.PCC CENTER</u> and <u>V.PCC BALANCE</u> to the best using the [←] and [→].</p> <p>Press the [F] to return to the main menu.</p>	

[illegible]

Item Program Menu	<input type="checkbox"/> Test Meter <input type="checkbox"/> Test Point <input type="checkbox"/> Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
O ABL  Adjust OTHER setting	<input type="checkbox"/> Totally white pattern <input checked="" type="checkbox"/> TV COLOR ANALYZER II	O1 O2 O3  O4 O5  OE	MODE-43	Set the CONTRAST --- MAX, BRIGHTNESS --- CENTER, COLOR --- 9300K using the OSD of the monitor set. Set the cell to the menu at left and press the [OK]. Feed the signal at left and bring the sensor of the analyzer to the screen image center. Move the cell to ABL 9300K and adjust as shown at right. Change the ABL 6550K data values the same as ABL 9300K using [F1] and [F2]. Press [F3] to return to the main menu.	$Y=130\text{cd/m}^2$ $\pm 10\%$
P INPUT 1.0V SETTING  8) Special ADJUST	<input type="checkbox"/> Totally white pattern	P1 P2 P3  P4 P5 PE	MODE-43	Set the cell to the menu at left and press the [OK]. Select 1: VIDEO 1.0V ADJUST from the menu. Set the CONTRAST MAX and VIDEO INPUT 1.0V using the OSD of the monitor set. Press the [OK] against the message of "hit return key". Press the [F1] as other message is displayed. Press the [F2] to return to the menu of O2 and return to the main menu using the [F3].	
Q FINAL SETTING  9) Special ADJUST		Q1 Q2 Q3  Q4 QE	MODE-43	Set the cell to the menu at left and press the [OK]. Select the 9: FINAL TUNE from the menu. Press either Y or N when the message of "CANCEL USER PRESET DATA (y/n)->" has been output after a while. Key in 1 against the message of SELECT FLAG->. Press the [F2] to return to the menu of R2 and return to the main menu using the [F3].	
R DATA SAVING  5) Save data to FILE		R1 R2		Set the cell to the menu at left and press the [OK]. Key in the file name after { }:  Use SERIAL No. as a file name. (EXAMPLE: RF411557*411557.DAT)	

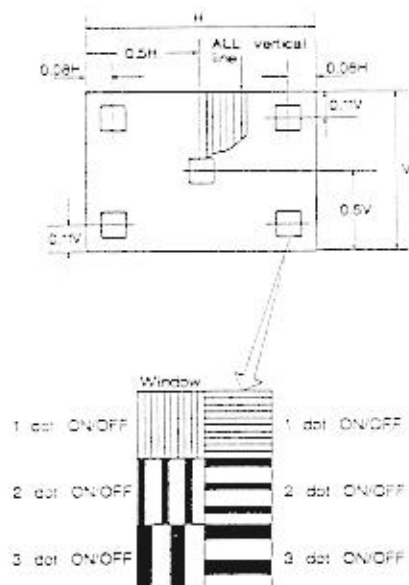
## CHECK ITEM

These items are intended for a recheck after adjustment and for a check of the following function operations:

1. Resolution check
2. Brightness variation check
3. Gradation check
4. Brightness check
5. Deflection linearity check
6. Distortion check
7. Image stability check
8. Blinking image check
9. Circuit operation check
10. Specific function check
11. Power save function check

### 1. Resolution Check

- (1) Apply resolution check pattern.



- (2) Check with the normal signal and inverted signal. Check to be sure that display color between dots is uniform and that there are no color difference and spotty display color.
- (3) Check the entire image quality including resolution.

### 2. Brightness Variation Check

- (1) Cause the white full dot pattern to be displayed with the Mode-57 signal.
- (2) Set the contrast to a maximum. Set the brightness to the center.
- (3) Make sure that a brightness difference between the center and periphery is  $< 65\%$  with the horizontal magnetic field in the condition of  $\pm 30 \mu T$ .

### 3. Gradation Check

- (1) Cause the 16 grayscale to be displayed with the Mode-43 signal. (White gradation waves.)
- (2) Set the contrast to a maximum and the brightness to the center.
- (3) At this time, the 1st gradation (black level) cannot be seen and the 2nd gradation must be barely lit.
- (4) With the brightness set to the center, vary the contrast from the maximum point and the gradation tracking must be good at that time.

**Note:** If tint ( particularly the gray, which is a middle color) is different, make adjustment of the white balance once again.

- (5) With the contrast set to a maximum, vary the brightness from the maximum point to the minimum point and check to be sure that the brightness of the low gradation portion changes.

**Note:** Check both the color select 9300K and 6550K.

#### 4. Brightness Check

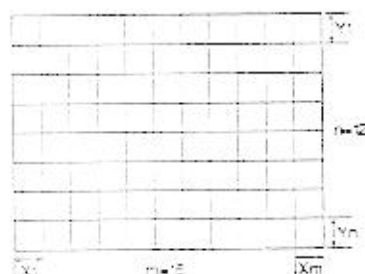
- (1) Cause the white full-flat field pattern to be displayed with the Mode-43 signal.
- (2) Make sure that the brightness value is  $< 15 \text{ cd/m}^2$  when the contrast is set to a minimum and the brightness to the center.

#### 5. Deflection Linearity Check

- (1) Display the green only crosshatch pattern.

$$\text{Horizontal linearity} = \frac{X_{\text{max.}} - X_{\text{min.}}}{X_{\text{max.}} + X_{\text{min.}}} \times 100\%$$

$$\text{Vertical linearity} = \frac{Y_{\text{max.}} - Y_{\text{min.}}}{Y_{\text{max.}} + Y_{\text{min.}}} \times 100\%$$



- (2) To confirm the horizontal deflection linearity, proceed in the next input signal modes:

$$\left. \begin{array}{l} \text{MODE-3, MODE-56} \\ \text{MODE-57, MODE-43} \end{array} \right\} 7\%$$

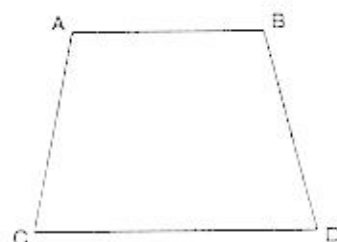
To confirm the vertical deflection linearity, proceed in the following input signal modes :

$$\left. \begin{array}{l} -1, -2 \\ -3, -4 \end{array} \right\} 6\%$$

#### 6. Distortion Check

- (1) Apply the signal of the following mode and supply the green crosshatch pattern.  
Mode-56  
Mode-57  
Mode-43
- (2) Make sure that each value comes within the values indicated below.

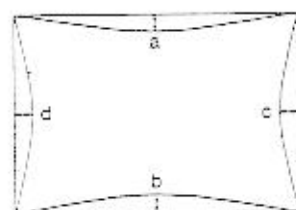
- Total distortion



$$\left| \frac{AC-BD}{AC+BD} \right| \times 100 \leq 1.3\%$$

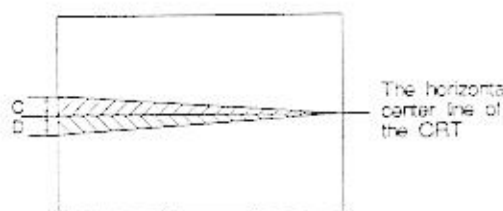
$$\left| \frac{AB-CD}{AB+CD} \right| \times 100 \leq 1.2\%$$

- Pincushion



$$a, b, c, d \leq 2.0 \text{ mm}$$

- Rotation



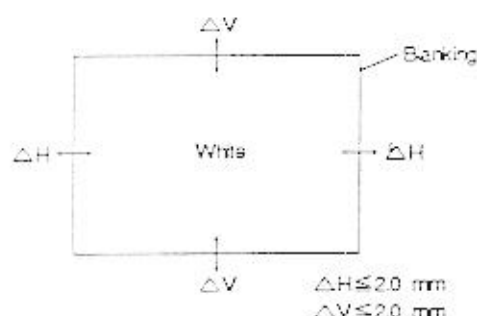
$$C, D \leq 2.5 \text{ mm}$$

## 7. Image Stability Check

- (1) Check to be sure that the size variations are  $< 2$  mm for horizontal size and  $< 1.5$  mm for vertical size when the white full dot pattern of Mode-56/ Mode-43 is displayed and the AC voltage is changed to 90 ~ 264 V.
- (2) Make sure that the size variations are  $< 2$  mm for horizontal size and  $< 1.5$  mm for vertical size when contrast is changed to a minimum from maximum at the AC voltage of 120V/240V.

## 8. Blinking Image Check

- (1) Apply blinking pattern signal. (100%)



- (2) Check the image stability at Mode-1 and Mode-3. Check if image changes due to blinking meets the standards below using the microscope.

## 9. Circuit Operation Check

- (1) Check the protection operation at fH not covered in the specifications.
- (2) Apply fH = 28 KHz and 66KHz signal and check to be sure that sync flows.

## 10. Specific Function Check

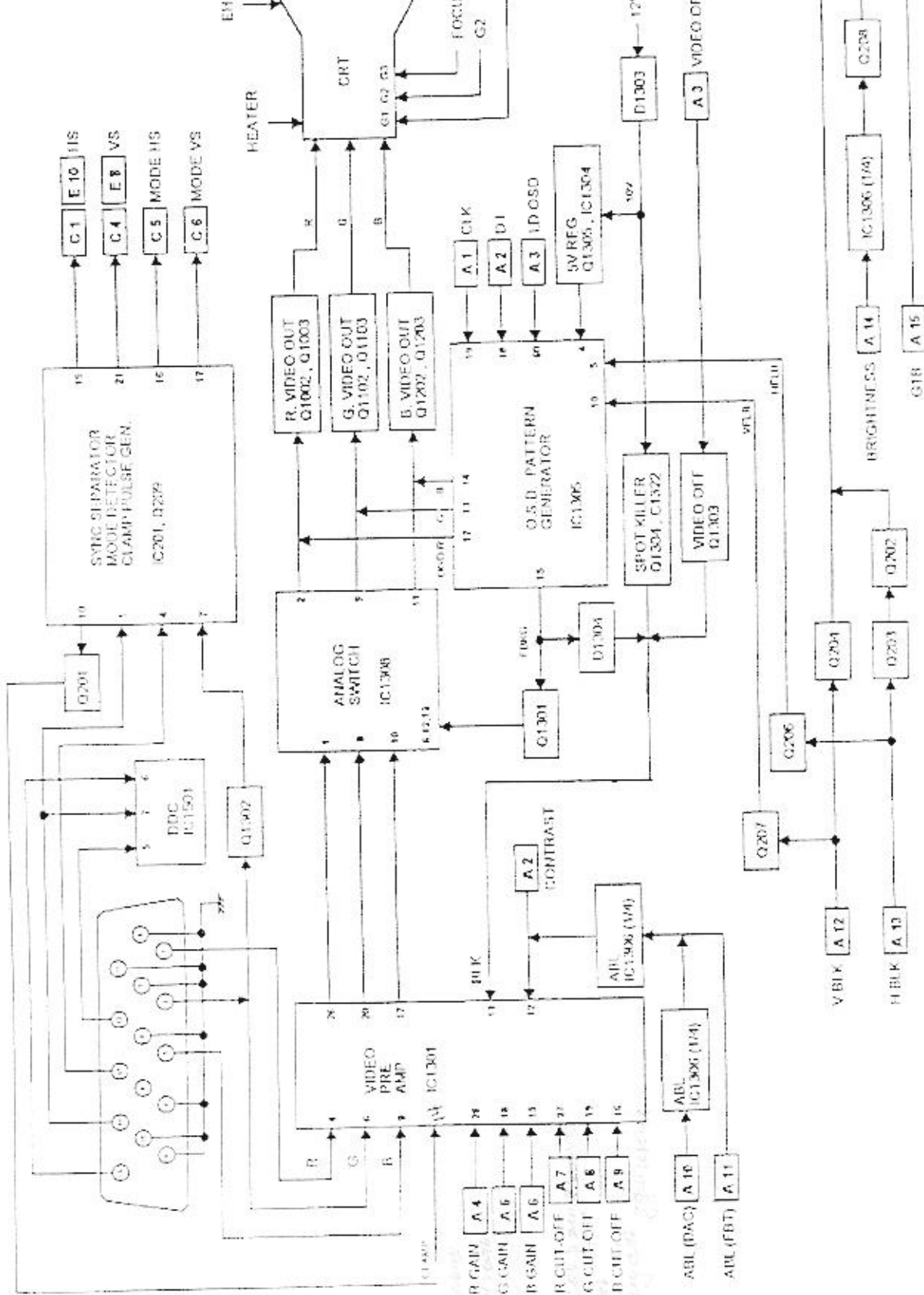
- (1) Create the crosshatch pattern using the Mode-3 signal of the preset timing.
- (2) Vary the vertical size and the deviation of the horizontal size and check to be sure that the horizontal size and horizontal position variations meet the values given below.

Vertical size	→ $\pm 20$ mm or more
Vertical position	→ up and down 5mm or more
Horizontal size	→ MIN. $< 250$ mm MAX. $> 250$ mm
Horizontal position	→ left 20 mm or more
Horizontal position	→ right 20 mm or more

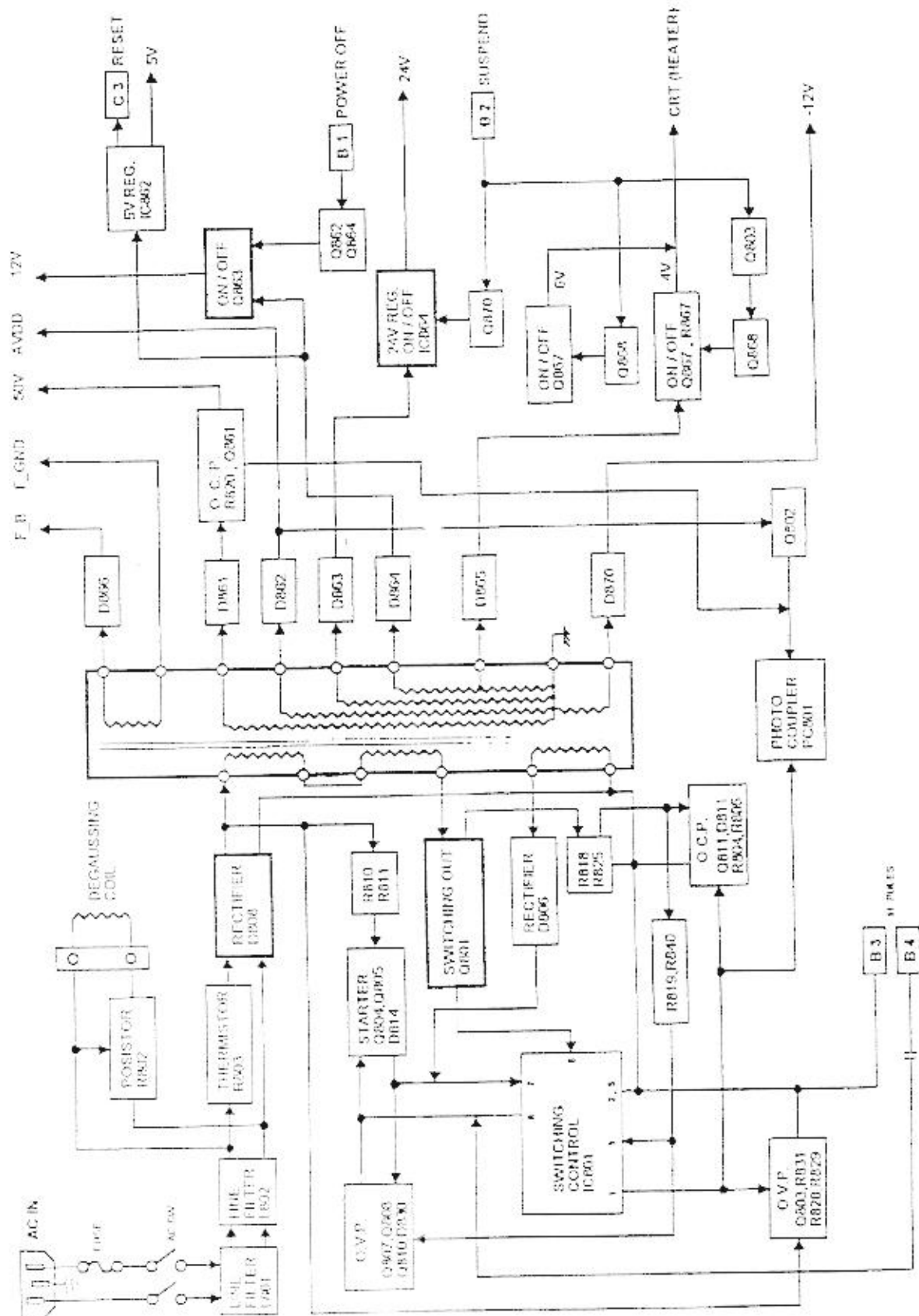
## 11. Power Save Function Check

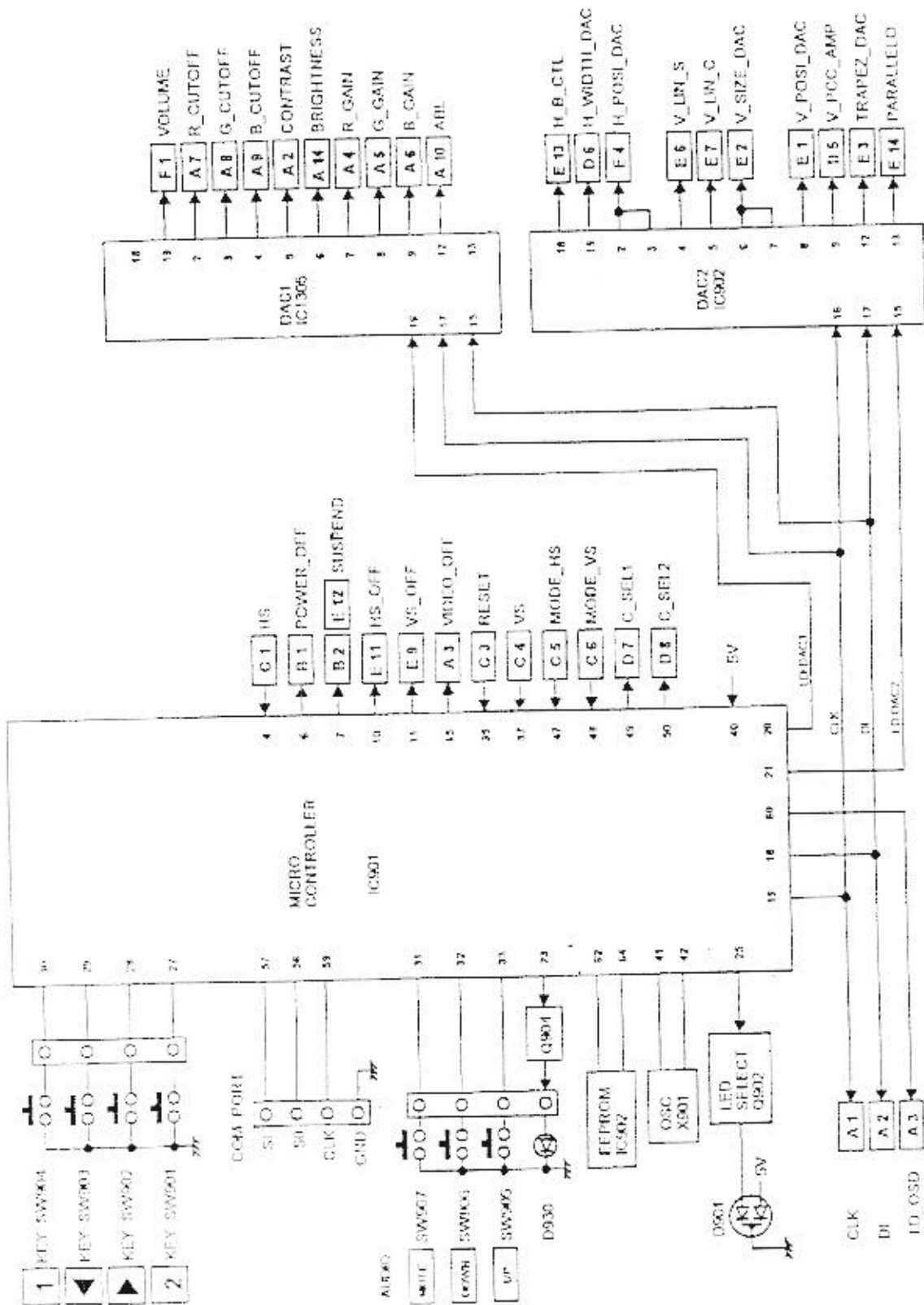
The power consumption must meet the specifications when the horizontal/vertical sync signals are changed as shown below.

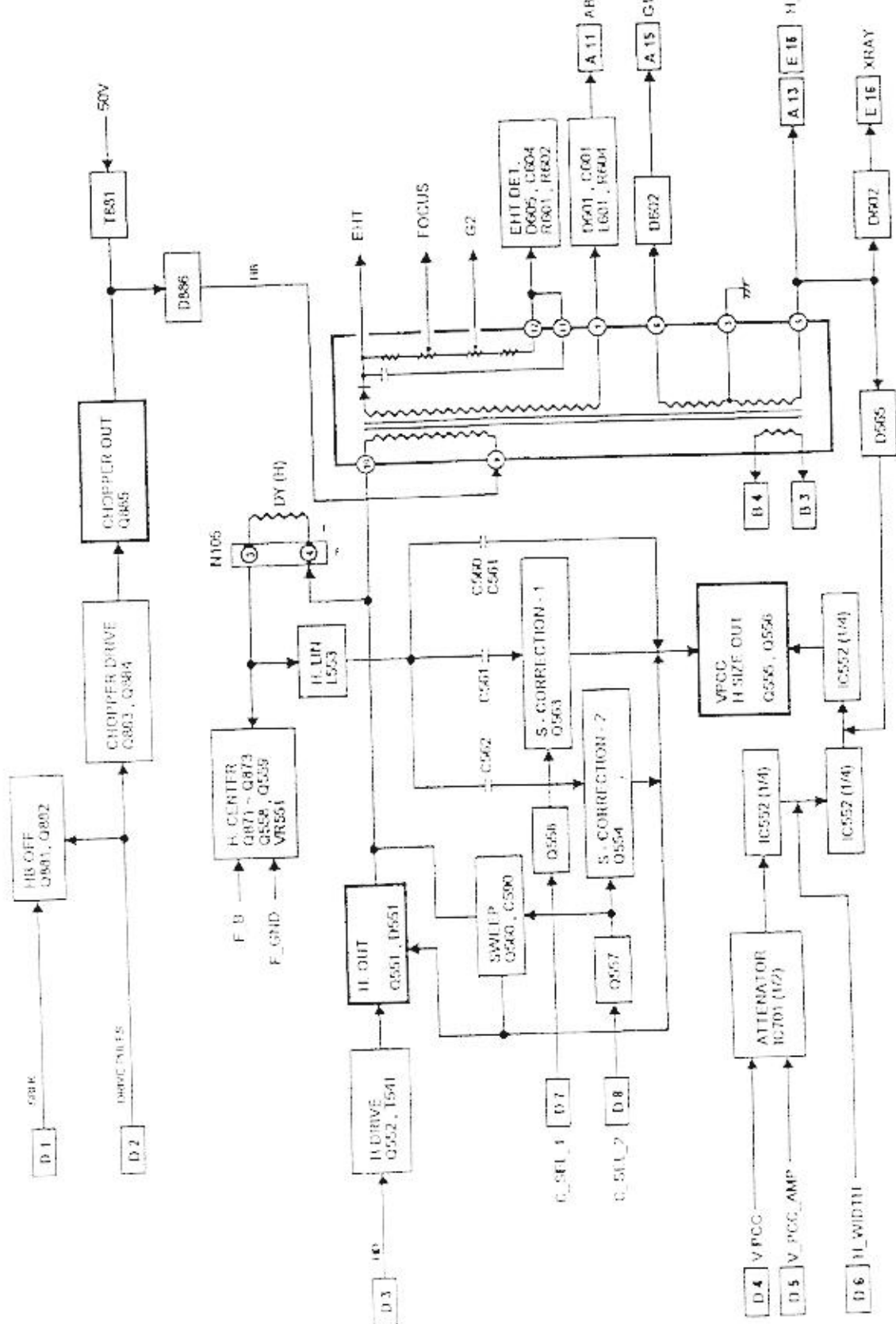
H.SYNC	OFF	ON	OFF
V.SYNC	ON	OFF	OFF
SPEC	$< 30W$	$< 30W$	$< 8W$

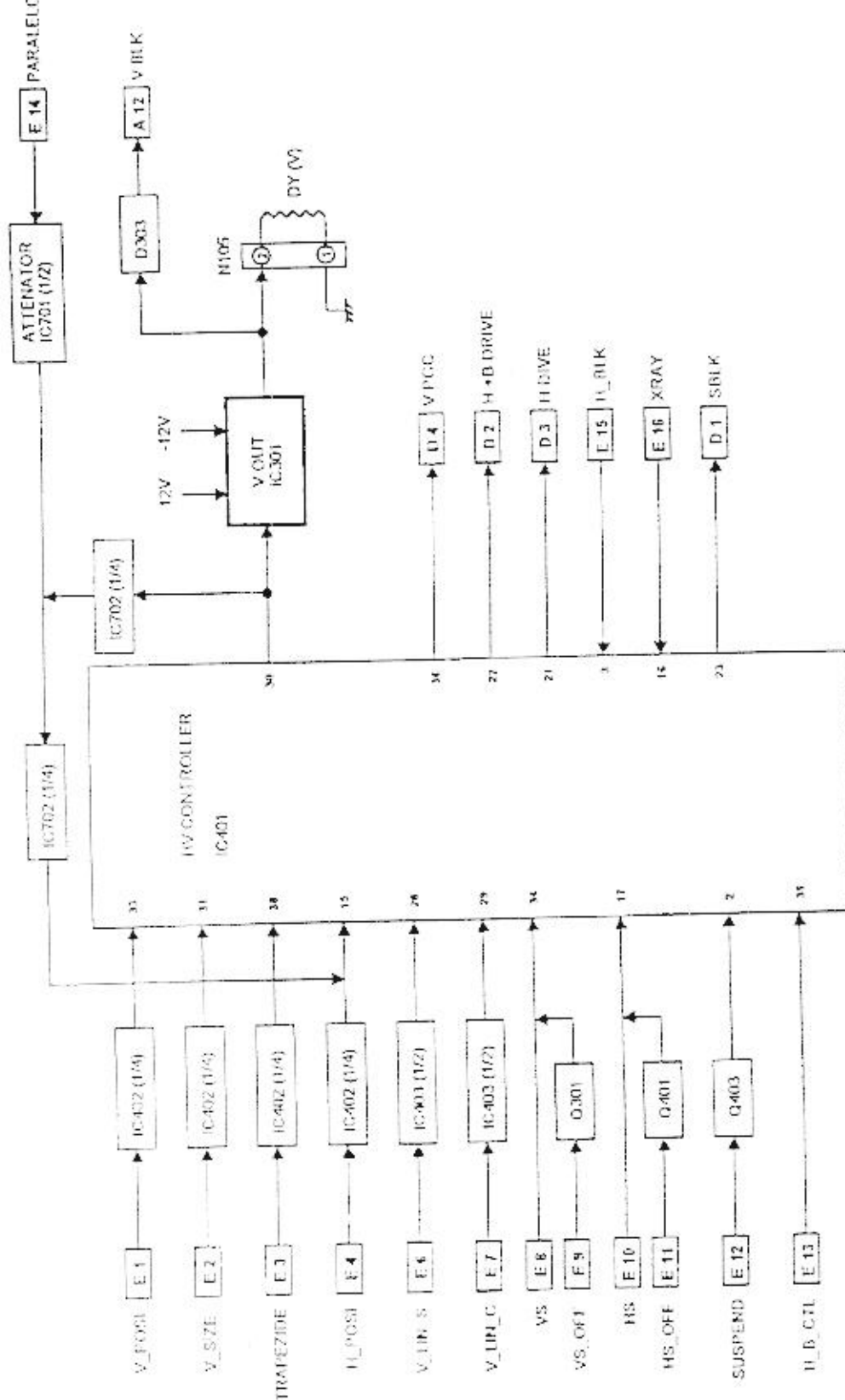




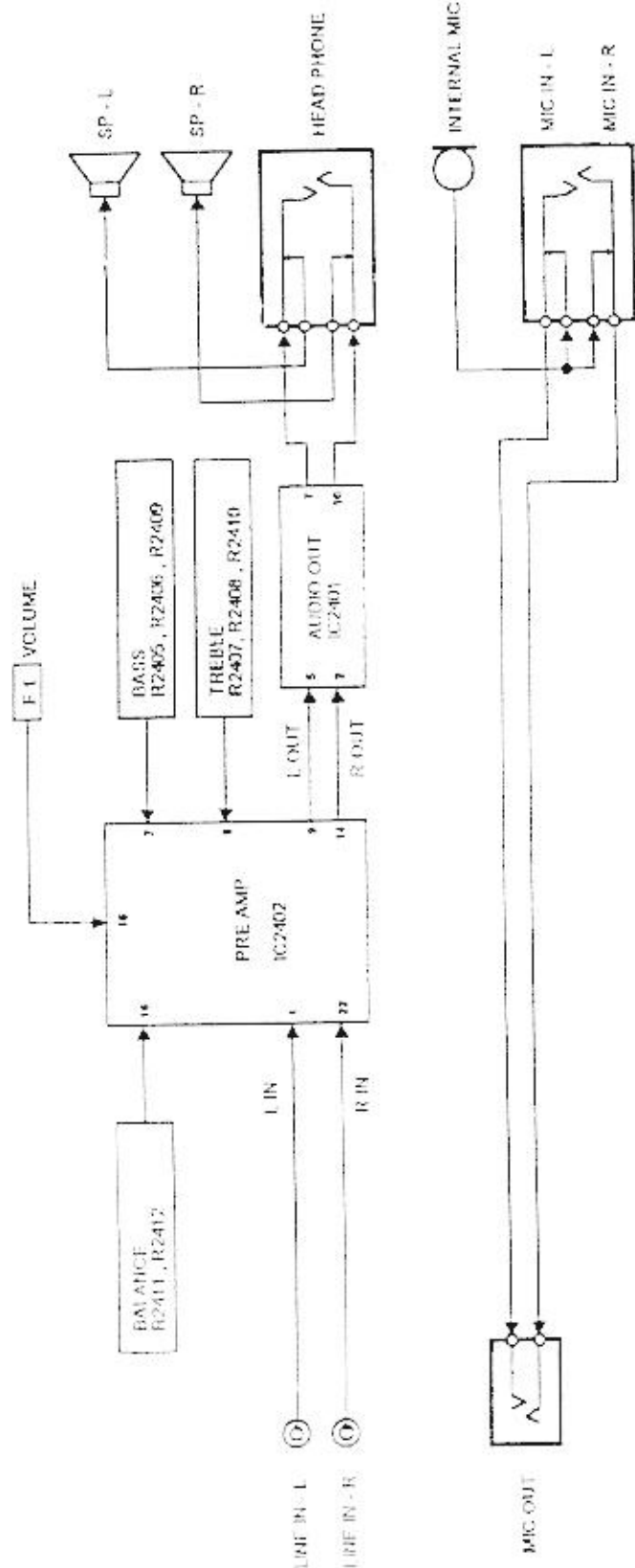


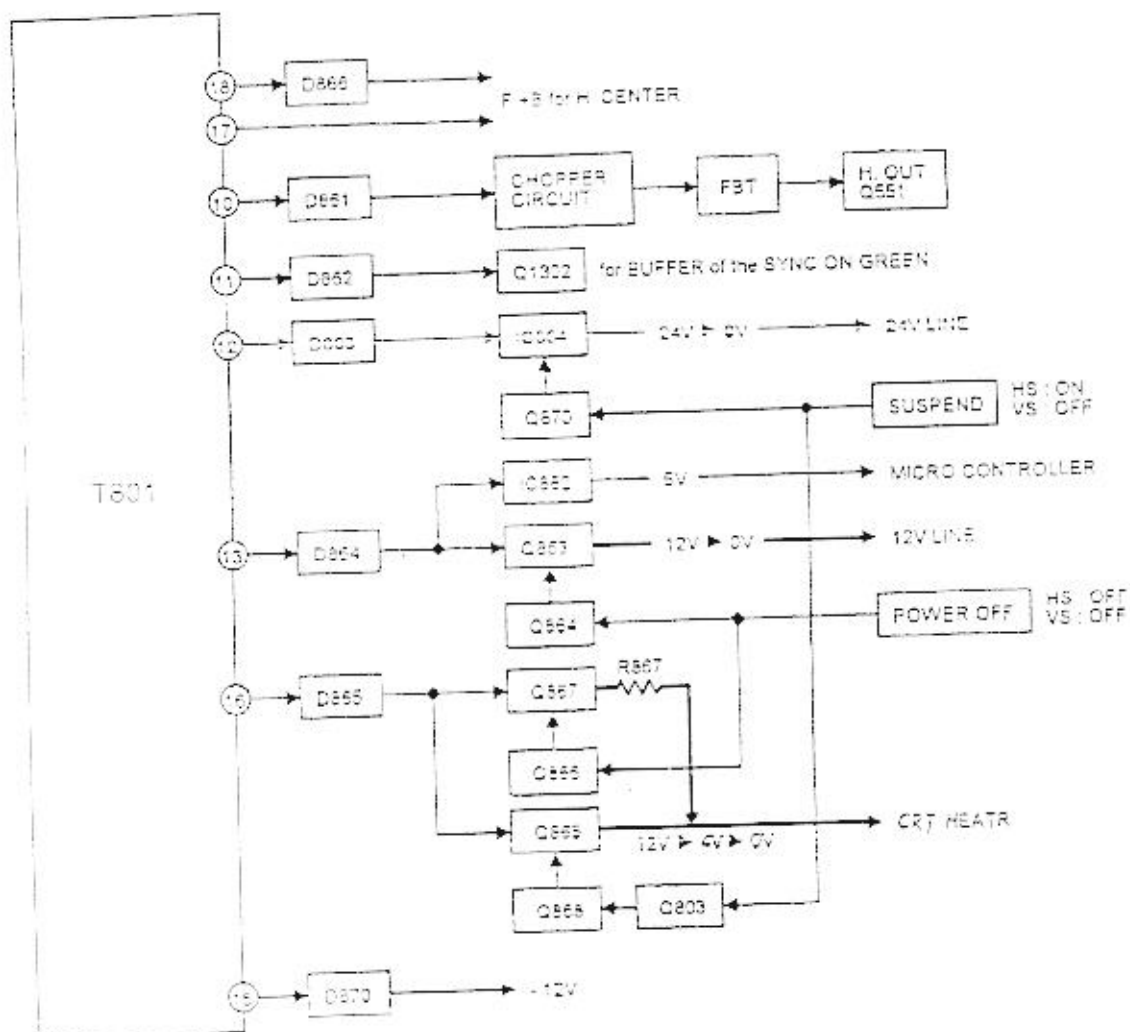






# AUDIO CONTROL





TRUTH TABLE FOR D.P.M.S.

	SYNC SIGNAL		D.P.M.S. SIGNAL	
	H. SYNC	V. SYNC	SUSPEND	POWER OFF
NORMAL	NORMAL	NORMAL	LOW	HIGH
(STAND-BY)	OFF	NORMAL	HIGH	HIGH
SUSPEND	NORMAL	OFF	HIGH	HIGH
POWER OFF	OFF	OFF	HIGH	LOW

## SERVICE WARNING

TO PREVENT RISK OF AN ELECTRIC HAZARD, TEST BEFORE TOUCHING. Where, after operation of the fuse in the live side of the main power supply, some components of the equipment that remain under voltage might represent a hazard during servicing.

## GENERAL INFORMATION

### 1. OUTLINE

This is a 15" color FS (flat square) CRT display with the following 11 features.

Stereo Dome Speakers with 2W+2W output and mic function are mounted on monitor, and Headphone is available to use.

This monitor also has OSD (on screen display) control and Power saving function based on VESA DPMS.

### 2. FEATURES

#### 2.1 Stereo Dome Speakers

- High quality stereo sound by ViewSonic Domes Speaker system.
- Audio typical output 2W +2W (electric).
- THD (Total Harmonic Distortion) maximum 1.0% (output = 1.0W).

#### 2.2 Mic function

A microphone is installed on the front panel of monitor for sending voice message to computer system. Also microphone jack is mounted on left side of monitor for additional use.

#### 2.3 Headphone function

Headphone jack is also mounted on left side of monitor to enjoy music, conversation and entertainment.


#### 2.4 Power Saving

Built in Power Saving function based on VESA-DPMS proposal.  
Power energy shall be saved by controlling the circuit in accordance with power save signal from computer.

#### 2.5 OSD function

OSD (on screen display) function is new and excellent man-machine interface.  
Any one is able to set up the picture as he like through OSD menu.

#### 2.6 Self-Test function

Self Testing picture comes out by pushing  -key in the case of no-connection with computer or power saving operation.  
This function shows if monitor is alive or not and can be used for self again test.

#### 2.7 VESA DDC 1/2B

Compliant with VESA DDC standard and applicable to DDC 1/2B uni-directional only.

#### 2.8 Ergonomics design

- Low emission design to meet with MPRII.
- ESF (Electro static field) free coating on CRT.

#### 2.9 Multi scan with digital technology

- 8 bit micro-computer controls the circuit operation to meet with wide range signal of fh= 30-69 KHz and fv= 50-160 Hz. So VESA640X 480, VESA800X 600, VESA1024X 768 and 1280X 1024 modes are applicable.

#### 2.10 3 Factory presets (+5 Reservation), 8 user memories

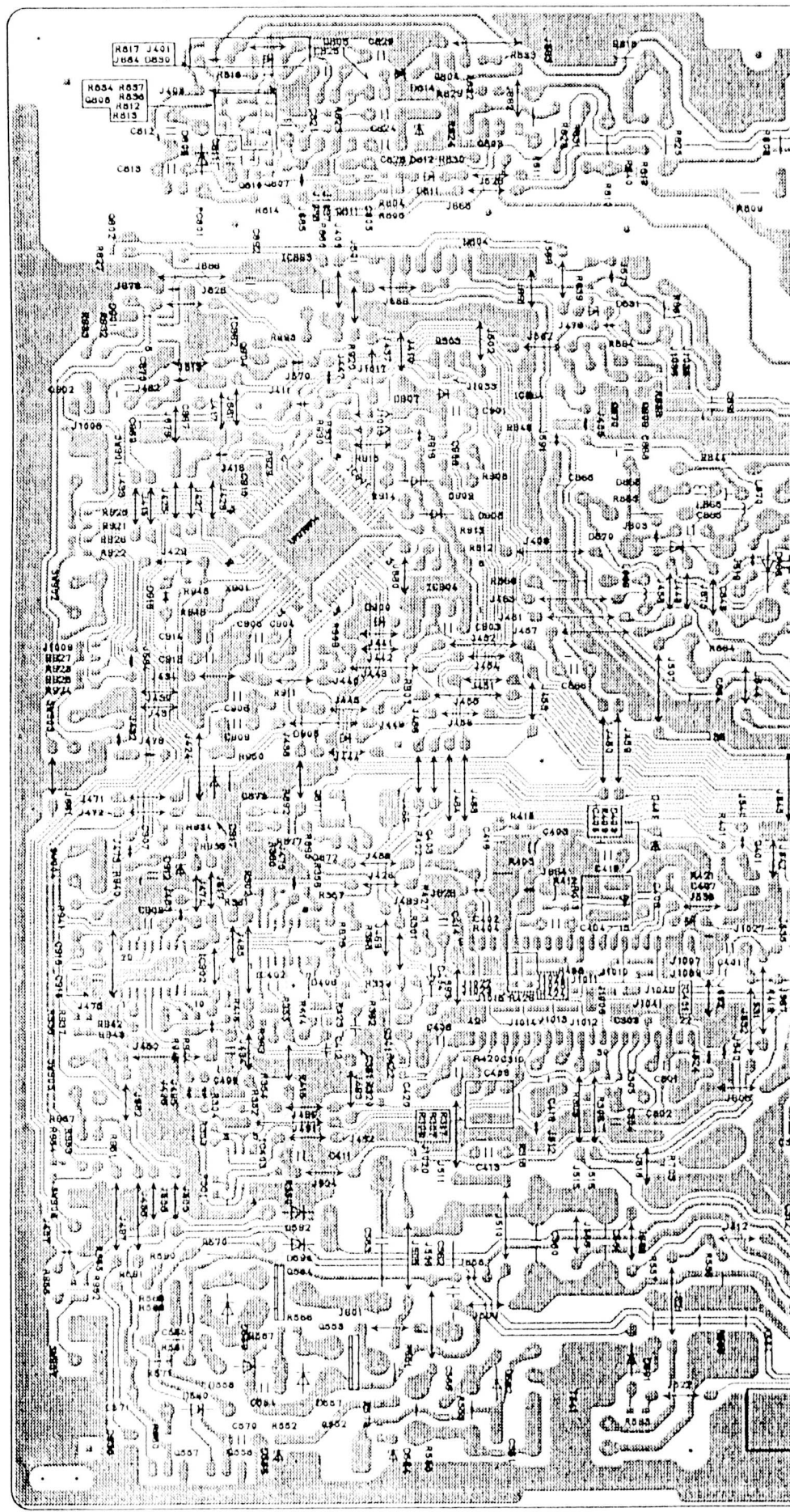
- 3 standard modes are preset at the factory.
- 5 modes are reserved at the factory.
- 8 user memories are available to set the users own timing and display information.

#### 2.11 Flat face and fine dot pitch

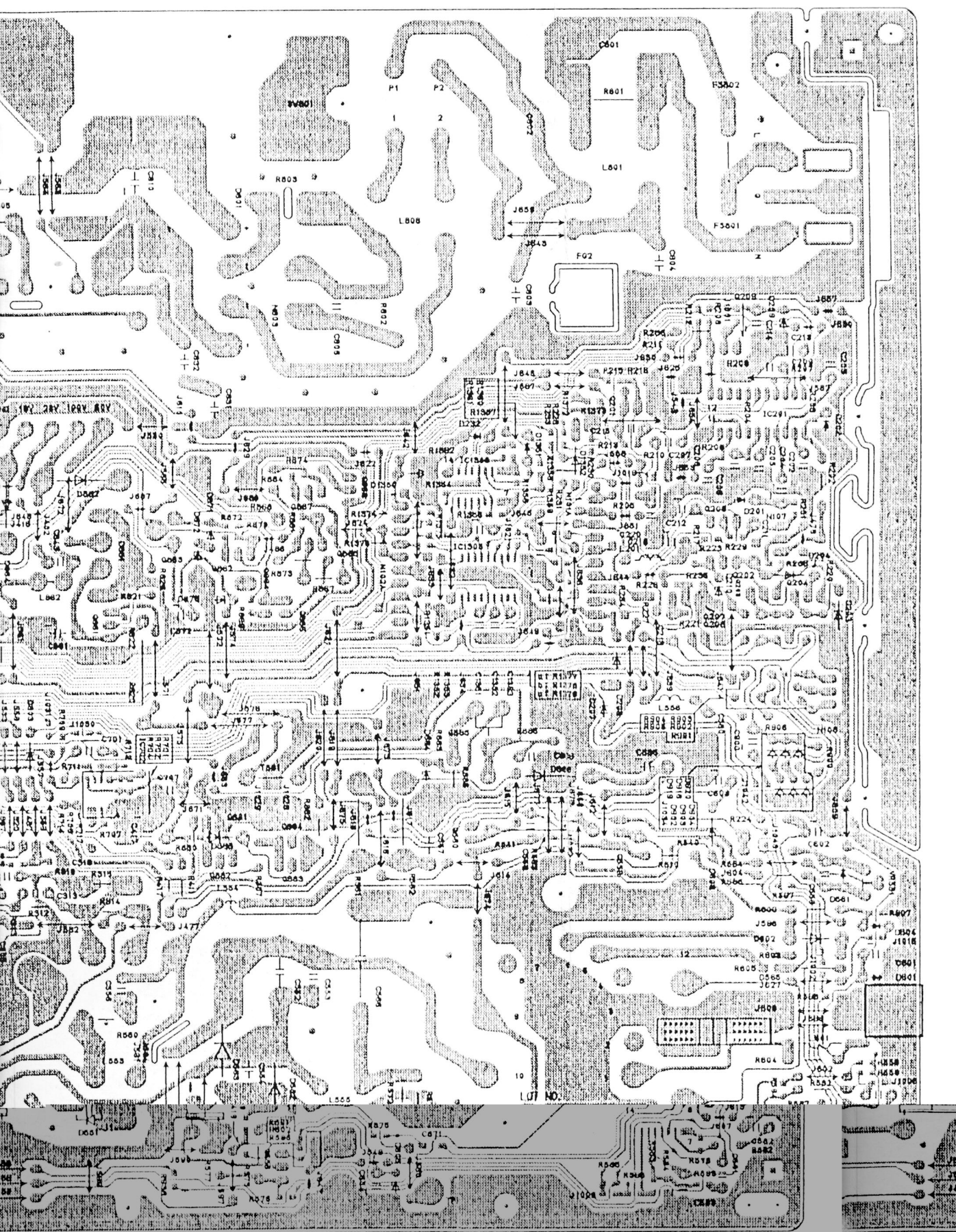
Flat face CRT with fine dot pitch 0.27mm gives comfortable sight of the screen.

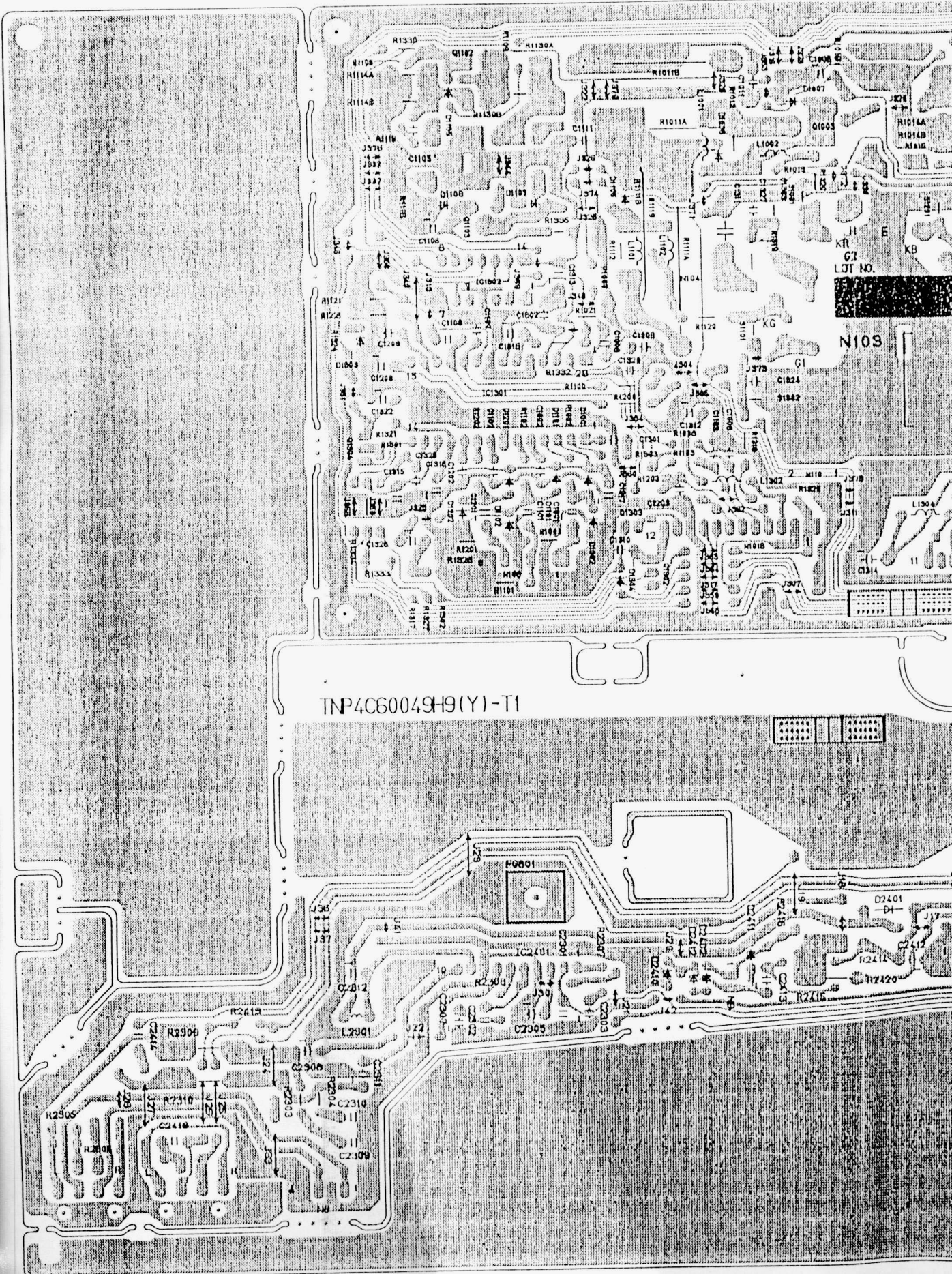
#### 2.12 Superior display performance

- High contrast.
- Minimized distortion by correction circuit.
- Good convergence.
- Users enjoy full scan image for graphics.



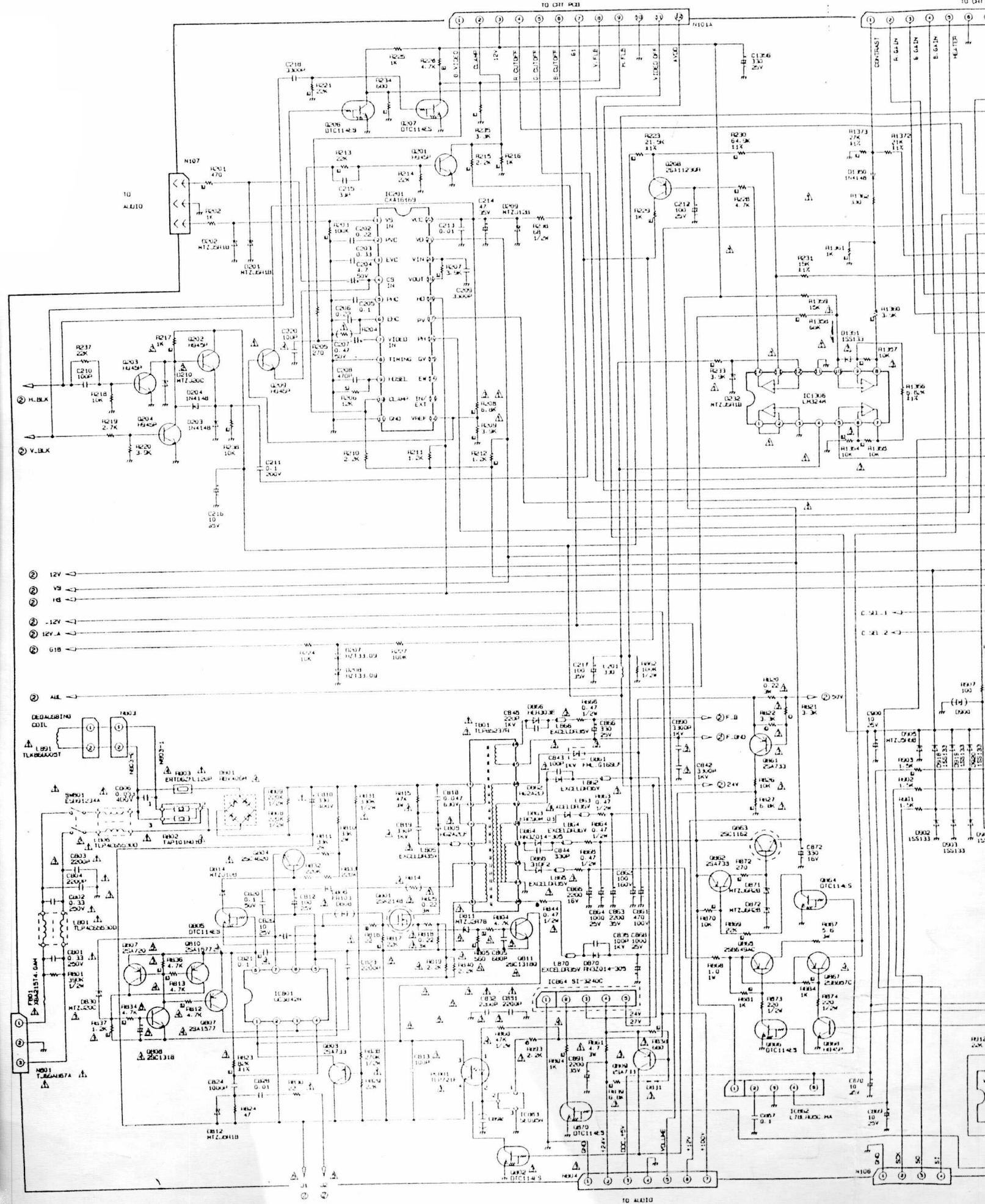














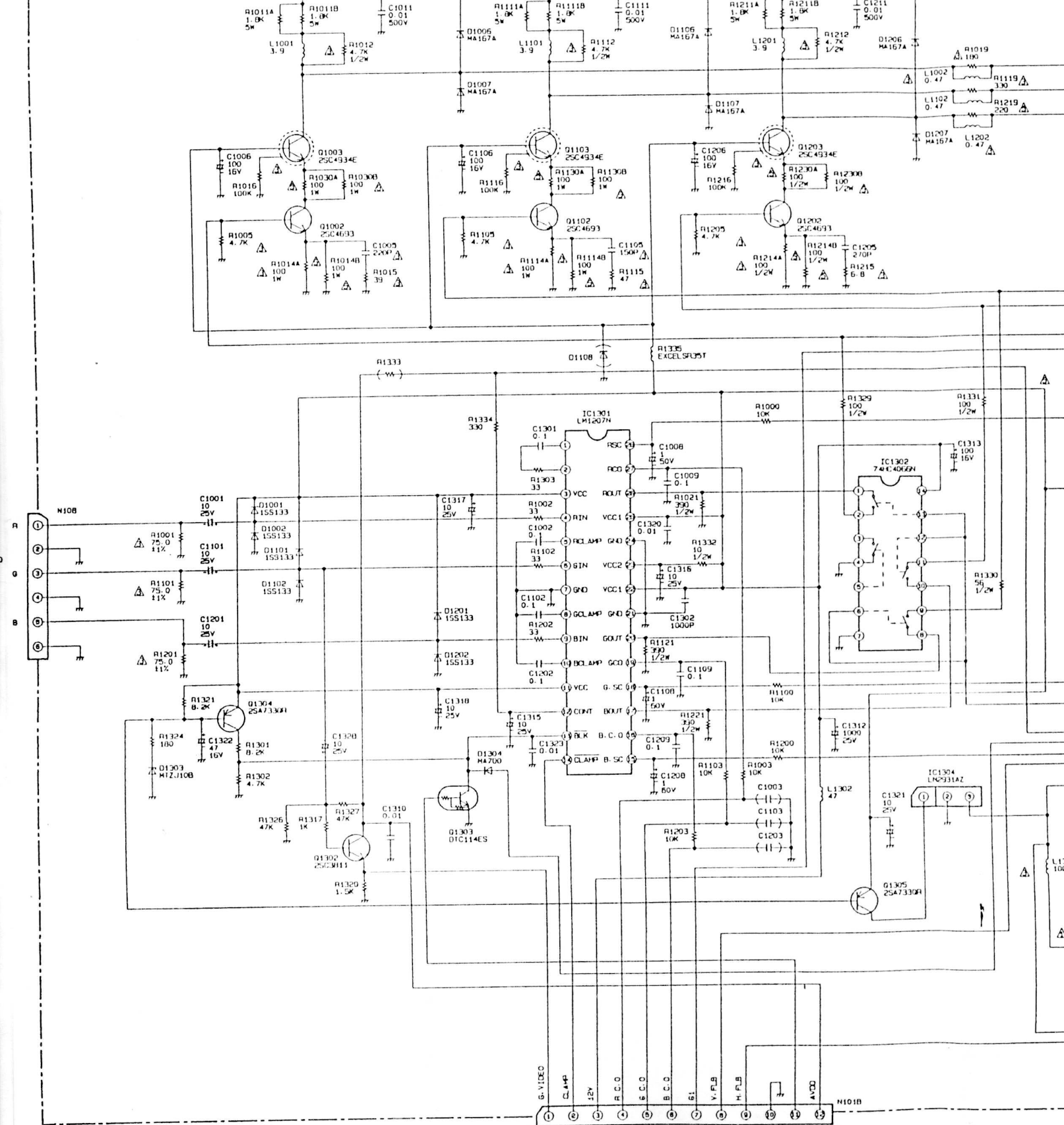






INSTRUMENT	 No Test
CAPACITOR	 No Power
TIME	

ESJ







ENGINEERING DEPT. SECTION				
MODEL NO.	1560GA-1M/-E/-A			ES3
DATE				1994.5.22





CAPACITOR	<input checked="" type="checkbox"/> Paper	<input checked="" type="checkbox"/> Metallized Polyimide	<input type="checkbox"/> Polyester	<input checked="" type="checkbox"/> Polycarbonate	<input type="checkbox"/> Glass	<input type="checkbox"/> Ceramic	<input type="checkbox"/> Other
ENGINEERING DEPT. SECTION							

HTID NO.	15696A-1M/-1
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15653A-1	15653A-1
DRAWING	15653A-4

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● 2010 年 10 月 1 日起, 凡在境内销售货物或提供应税劳务, 以及进口货物的单位和个人, 必须按照《中华人民共和国增值税暂行条例》(以下简称《条例》) 的有关规定, 缴纳增值税。

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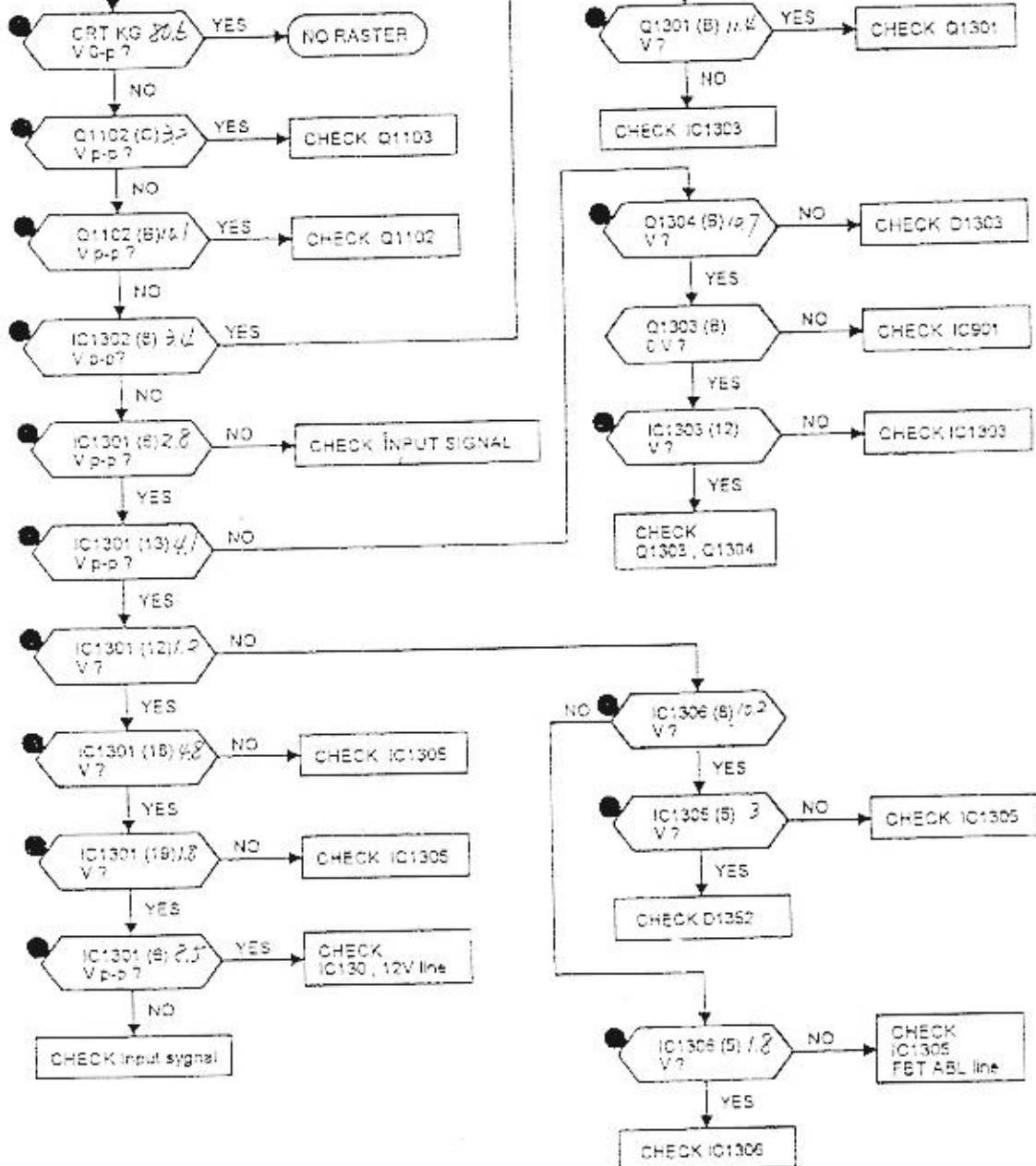
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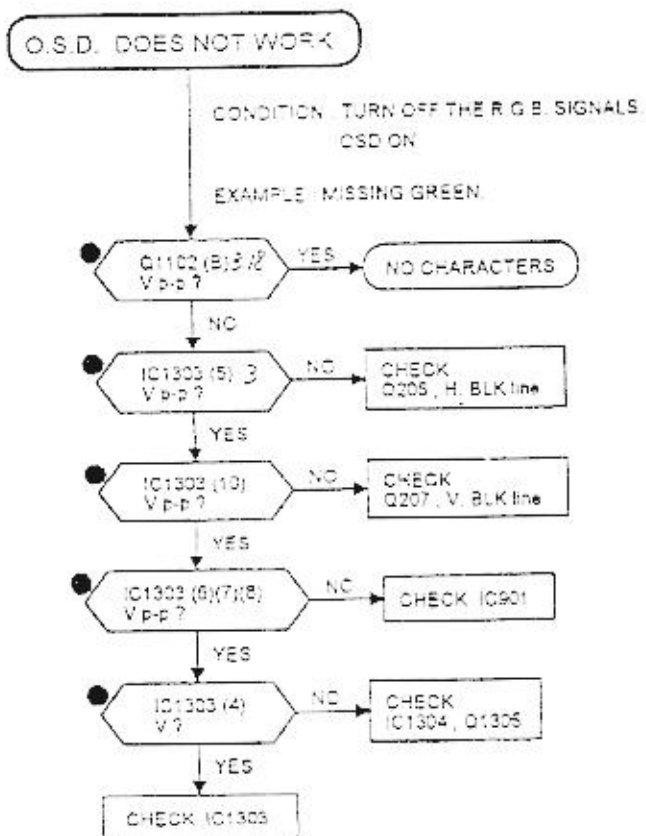
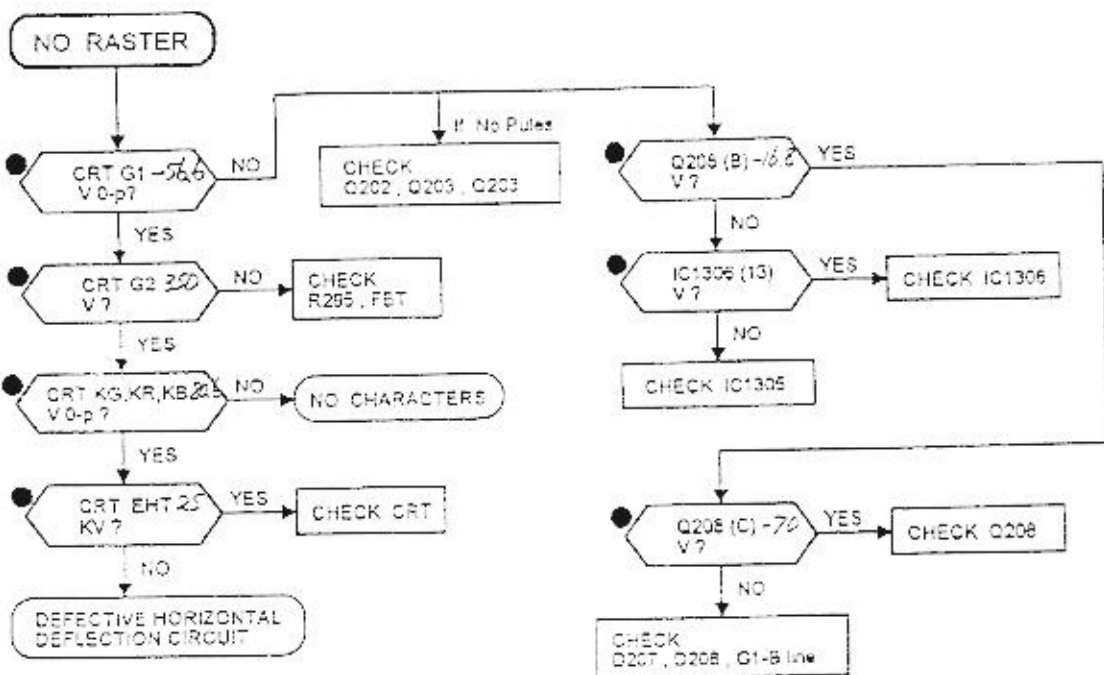
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# TROUBLESHOOTING HINTS

- NO CHARACTERS
- MISSING ONE COLOR

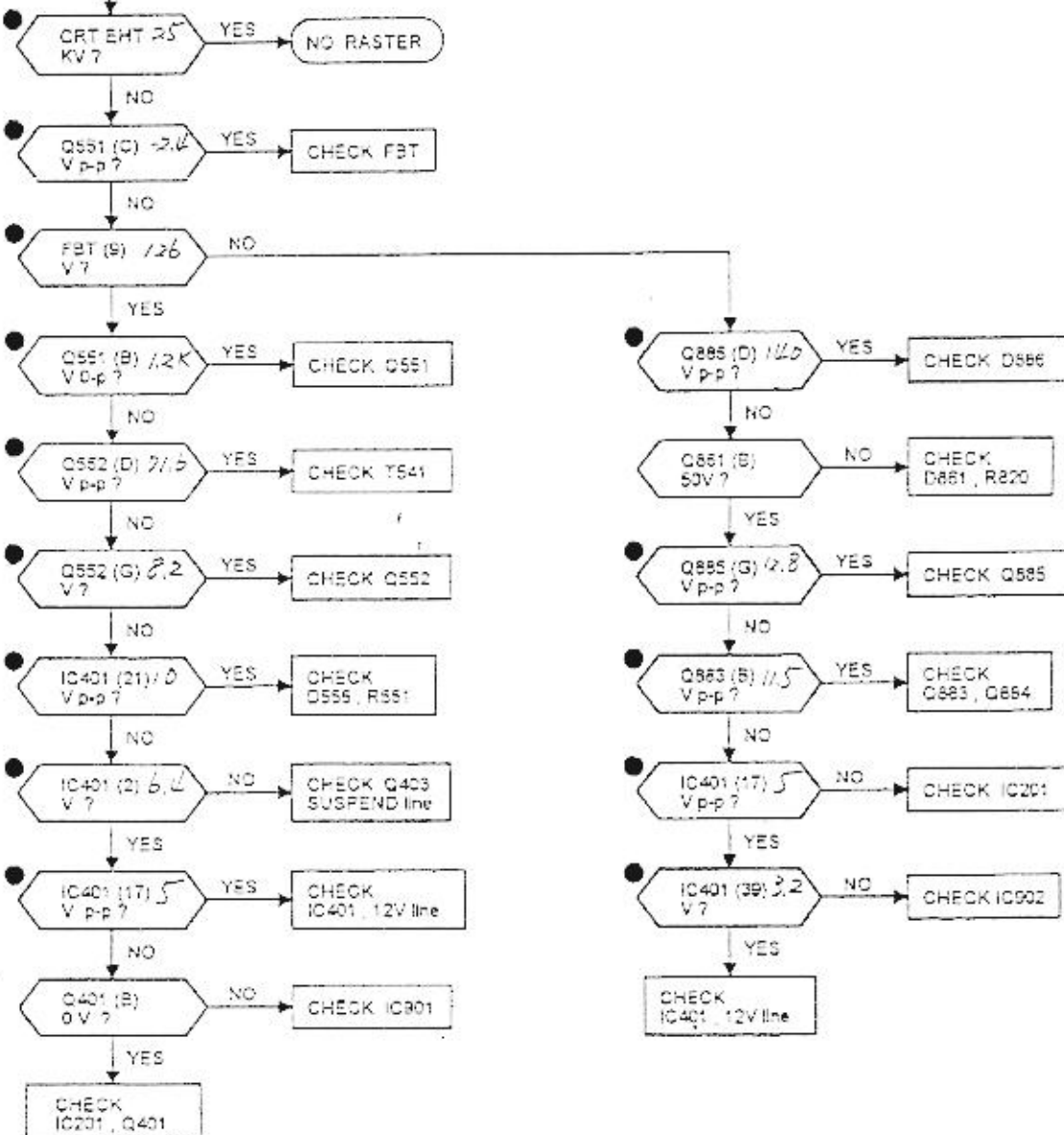
EXAMPLE: GREEN MISSING

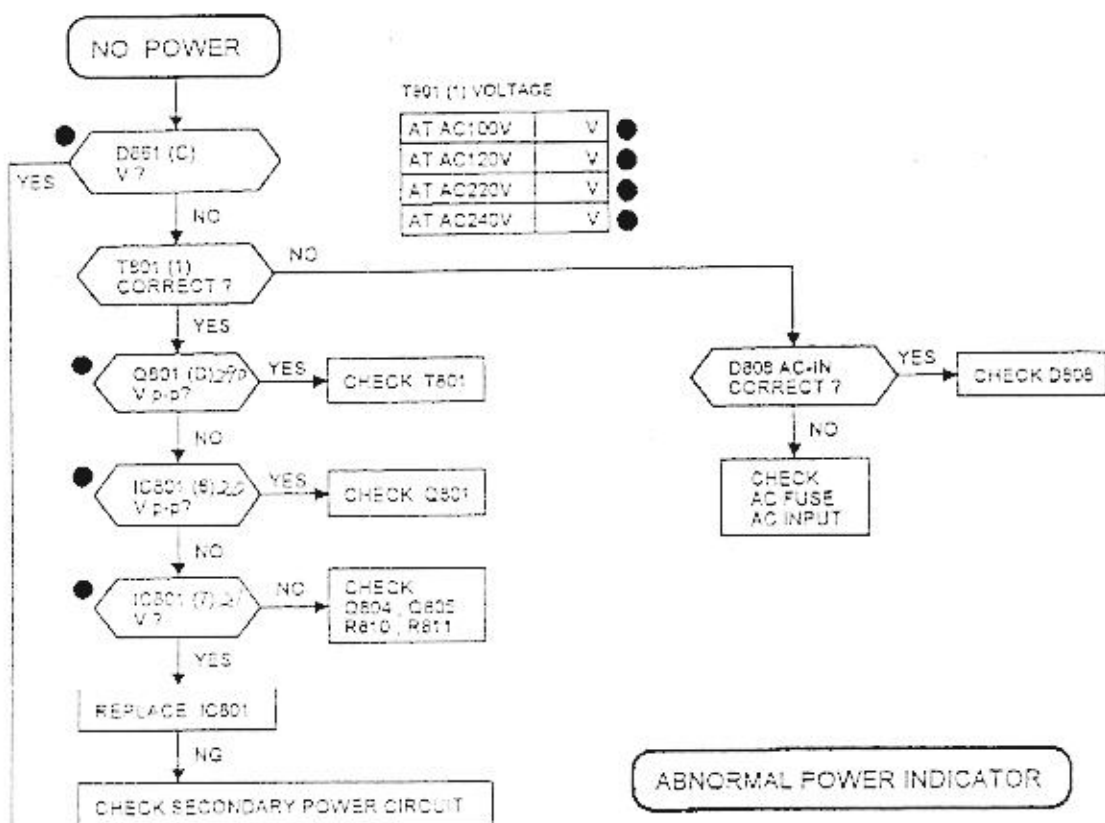




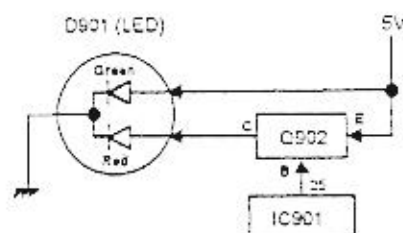
# DEFECTIVE HORIZONTAL DEFLECTION CIRCUIT

CONDITION  
1024 X 768 / H 60KHz / V 75Hz



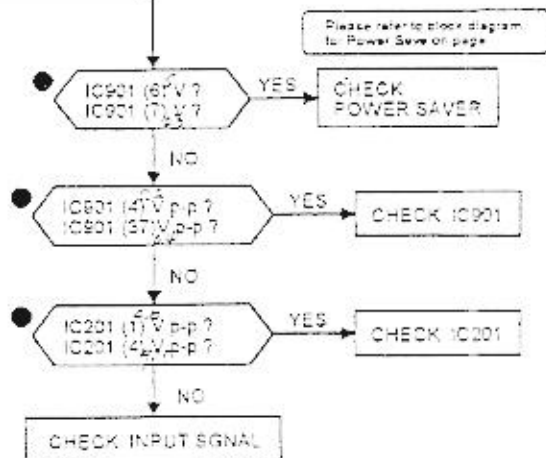


# ABNORMAL POWER INDICATOR



HS	VS	Q902(B)	COLOR
ON	ON	HIGH	GREEN
OFF	ON	LOW	YELLOW
ON	OFF	LOW	YELLOW
OFF	OFF	LOW	YELLOW

## SIGNAL: SEPARATE SYNC ABNORMAL POWER SAVER



# INCORRECT H. POSITION CONTROL

CONDITION  
1024 X 768 / H 60KHz / V 75Hz

RASTER POSITION  
CENTER ?

YES

NO

Q559, Q560 (8)  
TURN VR551  
V - V ?

YES

CHECK  
Q559, Q560

NO

CHECK  
VR551, F\_B line

IC401 (15)  $\frac{A}{V}$  ?

YES

CHECK IC401

IC402 (5)  $\frac{A}{V}$  ?

YES

CHECK IC402

NO

CHECK IC902

# INCORRECT V. SIZE CONTROL

CONDITION  
1024 X 768 / H 60KHz / V 75Hz

IC301 (1)  $\frac{A}{V}$  ?

YES

CHECK IC301

NO

IC401 (31)  $\frac{A}{V}$  ?

YES

CHECK IC401

NO

IC402 (3)  $\frac{A}{V}$  ?

YES

CHECK IC402

NO

CHECK IC902

# INCORRECT H. SIZE CONTROL

CONDITION  
1024 X 768 / H 60KHz / V 75Hz

Q558 (8)  $\frac{A}{V}$  ?

YES

CHECK  
Q558, Q559

NO

IC552 (3)  $\frac{A}{V}$  ?

YES

CHECK IC552

NO

CHECK IC902

# INCORRECT V. POSITION CONTROL

CONDITION  
1024 X 768 / H 60KHz / V 75Hz

IC401 (33)  $\frac{A}{V}$  ?

YES

CHECK IC401

NO

IC402 (10)  $\frac{A}{V}$  ?

YES

CHECK IC402

NO

CHECK IC902



If no horizontal and/or vertical sync from PC, then the power save circuit becomes active.

### H. SYNC DOES NOT HOLD

If "H. Sync" and "H. Drive" frequency is different, IC401 should be stopped the H. Chopper. (H + B)

CHECK IC401

### V. SYNC DOES NOT HOLD

IC401 (34) 0.7  
V<sub>p-p</sub>?

YES

CHECK IC401

NO

CHECK IC201

### BRIGHT HORIZONTAL LINE APPEARS ON THE SCREEN

IC301 (5) 4.5  
V<sub>p-p</sub>?

YES

CHECK DY

NO

IC301 (1) 1.4  
V<sub>p-p</sub>?

YES

CHECK IC301, 12V line

NO

CHECK IC401

### INCORRECT V.PCC

CONDITION:  
1024 X 768 / H 60KHz / V 75Hz

Q555 (3) 0.6  
V<sub>D-p</sub>?

YES

CHECK Q555, Q556

NO

IC552 (5) 7  
V<sub>p-p</sub>?

YES

CHECK IC552

NO

IC701 (4) 4.7  
V<sub>p-p</sub>?

NO

CHECK IC401

YES

IC701 (2) 2.7  
V?

NO

CHECK IC902

YES

CHECK IC701

# Important Safety Notice

Components identified by the international symbol  $\Delta$  have special characteristics that are important for safety. When replacing any of these components use only manufacturer's specified parts.

## RESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	$\pm 1\%$
F	Fuse	J	$\pm 5\%$
M	Metal Oxide	K	$\pm 10\%$
S	Solid	M	$\pm 20\%$
G	Wire Wound	G	$\pm 2\%$
V	Variable Res.		
T	Thick Film Chip Resistor		

## CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	$\pm 0.25\text{ pF}$
E	Electrolytic	D	$\pm 0.5\text{ pF}$
P	Polyester	F	$\pm 1\text{ pF}$
S	Styrol	J	$\pm 5\%$
T	Tantalum	K	$\pm 10\%$
PP	Polypropylene	L	$\pm 15\%$
	CHIP	M	$\pm 20\%$
		P	+100% -0%
		Z	+80% -20%

Part No. Description  
Example: ERDS1TJ104TD  $\odot$  100 K $\Omega$   $\odot$  1/4W

Part No. Description  
Example: ECQM1H104JZ3M  $\odot$  0.01  $\mu\text{F}$   $\odot$  50V

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
CABINET & MAIN PARTS					
	EAG903A	SPEAKER (2W)		TMM85537T	MICROPHONE GUM
$\Delta$	M36KPC000X01	C.R.T (15")		TNP4C69048-22	MAIN PCB (W/ COMPONENTS)
	STQF1562A	LABEL		TNP4C69049-21	AUDIO/CRT PCB ( " )
	T2H320	H.S. FOIL		TNP4C69056-21	SUB PCB (W/ COMPONENTS)
$\Delta$	TBM4C458B	MODEL NO. PLATE(1569GA-1A)		TNQ803970	MICROPHONE
$\Delta$	TBM4C447C	MODEL NO. PLATE(1569GA-1M)		TPC4C03399-2	PACKING CASE
$\Delta$	TBM4C457B	MODEL NO. PLATE(1569GA-1E)	$\Delta$	TPE4C03020-2	SET COVER
	TBX8752301T	CONTROL BUTTON		TQB620267	O/I
	TBX8752401T	AUDIO BUTTON		TQD4C03020	PM. SOFTWARE SHEET BAG
$\Delta$	TBX8752501T	AC SWITCH BUTTON		TQD4C03021	PM. SOFTWARE SHEET
	TES4C0008	SW. SPRING		TQF4C0295	WARNING LABEL
$\Delta$	TKE8720A01T	FRONT CABINET		TQF4C03409	S/N (1569GA-1M)
$\Delta$	TKK4C0014-1	CENTER POST		TQF4C03427	BAR CODE LABEL(1569GA-1A)
	TKK859315-1T	POWER LED BAR		TQF4C03425	BAR CODE LABEL(1569GA-1E)
	TKK859316-1T	MUTE LED BAR		TQF80720-2	HWC LABEL
	TKK859740-3T	PANEL COVER		TQF86570T	PTB LABEL
	TKK859978-1T	AC SWITCH SHAFT		TQF86574T	US PATENT LABEL
	TKK859979-1T	PEDESTAL		TQF86608T	EARTH NOTICE LABEL
$\Delta$	TKU894901T	BACK COVER		TSAA3002T	RADIATOR
	TKX871801T	PCB SPACER		TSM4C06201-2	DISK
	TKX871901T	JACK HOLDER	$\Delta$	TSN83115-1	MAGNET
$\Delta$	TKY859501T	BOTTOM CABINET		TSX4C6108-2	AC CORD (1569GA-1A/1E)
$\Delta$	TLK869005T	DEGAUSS COIL	$\Delta$	TSX9416	AC CORD (1569GA-1M)
	TMK84549	REVALLOY(L)	$\Delta$	TSXF002	SIGNAL CABLE
	TMK84928-1T	SET LEG		TSXF005	SP. CABLE
	TMK87711T	MICROPHONE SPONGE		TSXF006	MIC. CABLE
	TMKE002T	BUTTON SPACER		TSXX001T	1P CONNECTOR WIRE
	TMKG001T	GUM		TSXX002T	2P CONNECTOR WIRE
	TMM15404-1	SPACER RING		TSXX003T	3P CONNECTOR WIRE
	TMM16452	CLAMPER	$\Delta$	TTE8720A01-1T	FRONT CABINET
	TMM4C0025	WIRE CLIP		TUC85435T	TOP SHIELD CASE
	TMM4C0037	FOAM		TUC86986T	CRT EARTH METAL
	TMM4C0041	CLIP		TUC86987T	CRT EARTH METAL
	TMM4C0082	LEAD CLAMPER		TUC86988T	CRT EARTH METAL
	TMM7466	WIRE CLAMPER		TUC86989T	CRT EARTH METAL
	TMM81416	WIRE CLAMPER		TUC87581T	CRT PCB SHIELD CASE
	TMM82532-1	CRT GUM		TUCC5004T	REAR SHIELD CASE
				TUX86192T	BOTTOM PLATE

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
	TUXB6195T	ENFORCE METAL	C400	ECEA1ETK100BJ	E 10 uF 25V
	TXA3A2562VFMT	CRT KNT WIRE	C401	ECQM1H104JZ3M	P 0.1 uF J 50V
	TXAJTC2P751AT	2P CONNECTOR	C402	ECQM1H223JZ3M	P 0.022 uF J 100V
	TXAJTC3P1664T	3P CONNECTOR	C403	ECEA1CTK101BJ	E 100 uF 16V
	TXAJTC4P629T	4P CONNECTOR	C404	ECQP1H661GZ3M	P 680 pF G 50V
	TXAJTC6P581T	6P CONNECTOR	C405	ECQM1H103JZ3M	P 0.01 uF J 50V
	TXAPD1T1562	CUSHION	C406	ECQM1H224JZBM	P 0.22 uF J 50V
	THT1027	SCREW	C407	ECUV1H104ZFX	C 0.1 uF Z 50V
	THT1069	SCREW	C408	ECKR1H102KB1P	C 1000 pF K 50V
	TJT9913	SCREW	C409	ECQM1H473JZ3M	P 0.047 uF J 50V
	XTB5+16A	SCREW	C410	ECEA1CTK470BJ	E 47 uF 16V
	XTN5+15A	SCREW	C411	ECKR1H103KB1P	C 0.01 uF K 50V
	XTV3+10C	SCREW	C412	ECKR1H103KB1P	C 0.01 uF K 50V
	XYA4+EF8	SCREW	C413	ECEA1ETK100BJ	E 10 uF 25V
			C414	ECQM1H103JZ3M	P 0.01 uF J 50V
			C415	ECCR1H101JG1P	C 100 pF J 50V
			C417	ECKR1H103KB1P	C 0.01 uF K 50V
			C418	ECEA1HTK010BJ	E 1 uF 50V
			C420	ECKR1H222KB1P	C 2200 pF K 50V
	CAPACITORS		C551	ECKR2H391KB1P	C 390 pF K 500V
C11	ECUV1C225ZFW	C 2.2 uF Z 16V	C552	ECWH12H182JZBM	P 1800 pF J 50V
C13	ECUV1H102KBN	C 1000 pF K 50V	C553	ECWH12H182JZBM	P 1800 pF J 50V
C14	ECUV1H104ZFX	C 0.1 uF Z 50V	C554	ECQF6682JZBM3	P 6800 pF J 600V
C16	ECUV1H551KBN	C 550 pF K 50V	C555	ECKR3A331KB1P	C 330 pF K 1000V
C17	TAC1022Z104H	C 0.1 uF Z 100V	C556	ECKR3A331KB1P	C 330 pF K 1000V
C202	ECQM1H224JZBM	P 0.22 uF J 50V	C557	ECQE2224KZ3M	P 0.22 uF K 200V
C203	ECQV1H334JM3	P 0.33 uF J 50V	C558	ECKR1H102KB1P	C 1000 pF K 50V
C204	ECEA1HTK4R7BJ	E 4.7 uF 50V	C559	ECEA1CTK470BJ	E 47 uF 16V
C205	ECQM1H104JZ3M	P 0.1 uF J 50V	C560	ECWF4244JZBM	P 0.24 uF J 400V
C206	ECQM1H224JZBM	P 0.22 uF J 50V	C561	ECWF4154JZBM	P 0.15 uF J 400V
C207	ECEA1HTK4R7BJ	E 0.47 uF 50V	C562	ECWF4334JZBM	P 0.33 uF J 400V
C208	ECCR1H471JG1P	C 470 pF J 50V	C563	ECWF4824JZBM	P 0.62 uF J 400V
C209	ECQM1H332JZ3M	P 3300 pF J 50V	C564	ECQM1H473JZ3M	P 0.047 uF J 50V
C210	ECCR1H101JG1P	C 100 pF J 50V	C565	ECQM1H473JZ3M	P 0.047 uF J 50V
C211	ECQE2104KF3M	P 0.1 uF K 200V	C566	ECQE1475JZBM	P 4.7 uF J 100V
C212	ECEA1ETK101BJ	E 100 uF 25V	C570	ECQM1H104JZ3M	P 0.1 uF J 50V
C213	ECKR1H103KB1P	C 0.01 uF K 50V	C571	ECQM1H104JZ3M	P 0.1 uF J 50V
C214	ECEA1VTK470BJ	E 47 uF 35V	C572	ECEA1HTK010BJ	E 1 uF 50V
C215	ECCR1H330JG1P	C 33 pF J 50V	C580	ECEA1VTK471EJ	E 470 uF 35V
C216	ECEA1VTK100BJ	E 10 uF 35V	C581	ECEA1EGN101B	E 100 uF 25V
C217	ECEA1VTK101BJ	E 100 uF 35V	C582	ECEA1ETK101BJ	E 100 uF 25V
C218	ECQM1H332JZ3M	P 3300 pF J 50V	C583	ECEA1ETK100BJ	E 10 uF 25V
C220	ECCR1H101JG1P	C 100 pF J 50V	C584	ECQV1H104JM3	P 0.1 uF J 50V
C301	ECQV1H225JL3	P 2.2 uF J 50V	C590	ECQF6222JZBM3	P 2200 pF J 600V
C302	ECQM1H154JZBM	P 0.15 uF J 50V	C591	ECWH12H152HS	P 1500 pF 1200V
C303	ECUV1H103K8G	C 0.01 uF K 50V	C592	ECQM1H104JZ3M	P 0.1 uF J 50V
C304	ECEA10GE101B	E 100 uF 16V	C601	ECEA1HTK010BJ	E 1 uF 50V
C305	ECQM1H104JZ3M	P 0.1 uF J 50V	C602	ECEA20GE100B	E 10 uF 160V
C306	ECCR1H681JG1P	C 680 pF J 50V	C603	ECEA2ATK220BJ	E 22 uF 100V
C307	ECEA1EGE471B	E 470 uF 25V	C604	ECEA1HTK4R7BJ	E 4.7 uF 50V
C308	ECQV1224JM3	P 0.22 uF J 100V	C701	ECEA1ETK100BJ	E 10 uF 25V
C309	ECEA1VTK101BJ	E 100 uF 35V	C703	ECEA1ETK100BJ	E 10 uF 25V
C310	ECCR1H330JG1P	C 33 pF J 50V	C705	ECEA1EGN100B	E 10 uF 25V
C311	ECEA1EGE471B	E 470 uF 25V	C707	ECKR1H103KB1P	C 0.01 uF K 50V
C313	ECKR1H102KB1P	C 1000 pF K 50V	△C801	ECQU2A334MNFT	P 0.33 uF 250V
C314	ECQV1H224JM3	P 0.22 uF J 100V	△C802	ECQU2A334MNFT	P 0.33 uF 250V
C315	ECQM1H223JZ3M	P 0.022 uF J 100V	△C803	TOKMNS222MFJ	C 2200 pF M 400V
C351	ECEA1ETK100BJ	E 10 uF 25V			

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
△ C804	TCKMNS222MFJ	C 2200 pF M 400V	C1005	ECCR1H221JG1P	C 220 pF J 50V
C805	ECCR1H661JG1P	C 680 pF J 50V	C1006	ECEA10GE101B	E 100 uF 16V
C806	ECQE4333KF3	P 0.033 uF K 400V	C1008	ECEA1HTK010BJ	E 1 uF 50V
C810	ECOS2GA331DB	E 330 uF 400V	C1009	ECQM1H104JZ3M	P 0.1 uF J 50V
C811	ECEA0JGE470B	E 47 uF 6.3V	C1010	ECKR1H103KB1P	C 0.01 uF K 50V
C812	ECEA1ETK101BJ	E 100 uF 25V	C1011	ECKC2H103KB1P	C 0.01 uF K 500V
C813	ECCR1H101JG1P	C 100 pF J 50V	C1101	ECEA1ETK100BJ	E 10 uF 25V
C818	ECQE6473JZ3M	P 0.047 uF J 600V	C1102	ECQM1H104JZ3M	P 0.1 uF J 50V
C819	ECKC3A331KB1P	C 330 pF K 1000V	C1105	ECCR1H151JG1P	C 150 pF J 50V
C820	ECQM1H104JZ3M	P 0.1 uF J 50V	C1106	ECEA10GE101B	E 100 uF 16V
C821	ECUV1H104ZFX	C 0.1 uF Z 50V	C1108	ECEA1HTK010BJ	E 1 uF 50V
C823	ECCR1H221JG1P	C 220 pF J 50V	C1109	ECQM1H104JZ3M	P 0.1 uF J 50V
C824	ECQM1H102JZ3M	P 1000 pF J 50V	C1110	ECKR1H103KB1P	C 0.01 uF K 50V
C825	ECEA1ETK100BJ	E 10 uF 25V	C1111	ECKC2H103KB1P	C 0.01 uF K 500V
C828	ECQM1H103JZ3M	P 0.01 uF J 50V	C1201	ECEA1ETK100BJ	E 10 uF 25V
△ C831	TCKMNS222MFJ	C 2200 pF M 400V	C1202	ECQM1H104JZ3M	P 0.1 uF J 50V
△ C832	TCKMNS222MFJ	C 2200 pF M 400V	C1205	ECCR1H181JG1P	C 180 pF J 50V
C835	ECKR3A101KB1P	C 100 pF K 1000V	C1206	ECEA10GE101B	E 100 uF 16V
C842	ECKC3A332KB1P	C 3300 pF K 1000V	C1208	ECEA1HTK010BJ	E 1 uF 50V
C843	ECKC3A101KB1P	C 100 pF K 1000V	C1209	ECQM1H104JZ3M	P 0.1 uF J 50V
C844	ECKR3A331KB1P	C 330 pF K 1000V	C1210	ECKR1H103KB1P	C 0.01 uF K 50V
C845	ECKR3A221KB1P	C 220 pF K 1000V	C1211	ECKC2H103KB1P	C 0.01 uF K 500V
C850	ECEA20GE100B	E 10 uF 16V	C1212	ECCR1H101JG1P	C 100 pF J 50V
C861	ECEA2AGE471E	E 470 uF 100V	C1301	ECQM1H104JZ3M	P 0.1 uF J 50V
C862	ECEA20GE101B	E 100 uF 16V	C1302	ECKR1H102KB1P	C 1000 pF K 50V
C863	ECEA1VGE222E	E 2200 uF 35V	C1304	ECCR1H101JG1P	C 100 pF J 50V
C864	ECEA1EGE102B	E 1000 uF 25V	C1305	ECCR1H220JG1P	C 22 pF J 50V
C865	ECEA10GE222B	E 2200 uF 16V	C1306	CEA1ATK221BJ	E 220 uF 10V
C866	ECEA1ETK331BJ	E 330 uF 25V	C1306	ECEA1ATK221BJ	E 220 uF 10V
C867	ECQM1H104JZ3M	P 0.1 uF J 50V	C1307	ECQM1H103JZ3M	P 0.01 uF J 50V
C868	ECEA1EGE102B	E 1000 uF 25V	C1308	ECQM1H393JZ3M	P 0.039 uF J 50V
C869	ECEA1ETK100BJ	E 10 uF 25V	C1309	ECQM1H103JZ3M	P 0.01 uF J 50V
C870	ECEA1ETK100BJ	E 10 uF 25V	C1310	ECQM1H103JZ3M	P 0.01 uF J 50V
C871	ECUV1C105ZFW	C 1 uF A 16V	C1311	ECKC3D272KB1P	C 2700 pF K 2000V
C872	ECEA10GE331B	E 330 uF 16V	C1312	ECEA10TK102EJ	E 1000 uF 16V
C885	ECEA2DGE101E	E 100 uF 200V	C1313	ECEA10GE101B	E 100 uF 16V
C886	ECKR2H221KB1P	C 220 pF K 500V	C1314	ECEA20GE101E	E 100 uF 160V
C887	ECQE2223JZ3M	P 0.022 uF J 200V	C1315	ECEA1ETK100BJ	E 10 uF 25V
C890	ECKC3A332KB1P	C 3300 pF K 1000V	C1316	ECEA1ETK100BJ	E 10 uF 25V
C891	ECEA1VTK222EJ	E 2200 uF 35V	C1317	ECEA1ETK100BJ	E 10 uF 25V
C891	ECEA1VGE222E	E 2200 uF 35V	C1318	ECEA1ETK100BJ	E 10 uF 25V
C900	ECEA1ETK100BJ	E 10 uF 25V	C1320	ECQM1H103JZ3M	P 0.01 uF J 50V
C901	ECCR1H220JG1P	C 22 pF J 50V	C1321	ECEA1ETK100BJ	E 10 uF 25V
C903	ECQM1H104JZ3M	P 0.1 uF J 50V	C1322	ECEA10TK470BJ	E 47 uF 16V
C904	ECCR1H221JG1P	C 220 pF J 50V	C1323	ECKR1H103KB1P	C 0.01 uF K 50V
C905	ECCR1H221JG1P	C 220 pF J 50V	C1324	ECKR2H391KB1P	C 390 pF K 500V
C906	ECCR1H221JG1P	C 220 pF J 50V	C1325	ECEA1ETK101BJ	E 100 uF 25V
C907	ECEA0JTK101BJ	E 100 uF 6.3V	C1327	ECKR3A152KB1P	C 1500 pF K 1000V
C908	ECCR1H101JG1P	C 100 pF J 50V	C1328	ECEA1ETK100BJ	E 10 uF 25V
C909	ECEA1HTK010BJ	E 1 uF 50V	C1329	ECKR1H103KB1P	C 0.01 uF K 50V
C910	ECCR1H220JG1P	C 22 pF J 50V	C1331	ECKR1H103KB1P	C 0.01 uF K 50V
C913	ECCR1H220JG1P	C 22 pF J 50V	C1351	ECCR1H101JG1P	C 100 pF J 50V
C914	ECCR1H220JG1P	C 22 pF J 50V	C1352	ECCR1H101JG1P	C 100 pF J 50V
C915	ECCR1H220JG1P	C 22 pF J 50V	C1353	ECCR1H101JG1P	C 100 pF J 50V
C916	ECCR1H220JG1P	C 22 pF J 50V	C1355	ECEA1ETK331BJ	E 330 uF 25V
C1001	ECEA1ETK100BJ	E 10 uF 25V	C1501	ECQB1H103JF3	P 0.01 uF J 50V
C1002	ECQM1H104JZ3M	P 0.1 uF J 50V	C2301	ECQB1H123JF3	P 0.012 uF J 50V

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
C2302	ECQB1H123JF3	P 0.012 uF J 50V	D406	MA28W-ATX	CHIP DIODE
C2303	ECEA1EGE220B	E 22 uF 25V	D551	FMP-G2FS	DIODE
C2304	ECEA1HKG010B	E 1 uF 50V	D552	31DF6HC(A)	DIODE
C2305	ECEA1CTK221BJ	E 220 uF 16V	D554	11D004TA2	DIODE
C2306	ECEA1HKG010B	E 1 uF 50V	D555	RG2ALFC4-H	DIODE
C2307	ECEA1EGE220B	E 22 uF 25V	D556	MTZJ15BT77	ZENER DIODE
C2308	ECEA1CTK471BJ	E 470 uF 16V	D557	1N5818E-2	DIODE
C2309	ECQB1H104JF3	P 0.1 uF J 50V	D558	10DF6-TA2	DIODE
C2310	ECQB1H104JF3	P 0.1 uF J 50V	D560	10DF6-TA2	DIODE
C2311	ECEA1CTK471BJ	E 470 uF 16V	D561	MTZJ5R8BT77	ZENER DIODE
C2312	ECEA1EGE102B	E 1000 uF 25V	D562	1N4148TB52	DIODE
C2312	ECEA1ETK102EJ	E 1000 uF 25V	D562	1N4148TB26	DIODE
C2401	ECEA1HKG2R2B	E 2.2 uF 50V	D563	RP3F014-302	DIODE
C2402	ECEA1HKG2R2B	E 2.2 uF 50V	D565	1N4148TB52	DIODE
C2403	ECQB1H223JF3	P 0.022 uF J 50V	D565	1N4148TB26	DIODE
C2404	ECEA1HKG2R2B	E 0.22 uF 50V	D590	EU02AV0	DIODE
C2407	ECQB1H223JF3	P 0.022 uF J 50V	D590	EU02AV0-H	DIODE
C2408	ECEA1HKG2R2B	E 0.22 uF 50V	D591	1N4148TB52	DIODE
C2409	ECEA1CKG100B	E 10 uF 16V	D591	1N4148TB26	DIODE
C2410	ECEA1CKG220B	E 22 uF 16V	D592	EU02AV0-H	DIODE
C2411	ECEA1HKG010B	E 1 uF 50V	D601	1SS133T77	DIODE
C2412	ECEA1CTK221BJ	E 220 uF 16V	D602	EU02ZV0-H	DIODE
C2413	ECEA1CTK470BJ	E 47 uF 16V	D603	1N4148TB52	DIODE
C2414	ECEA1HGN010B	E 1 uF 50V	D603	1N4148TB26	DIODE
C2415	ECQB1H103JF3	P 0.01 uF J 50V	D604	MA700TA	DIODE
C2420	ECKR1H102KB1P	C 1000 pF K 50V	D605	MTZJ15BT77	ZENER DIODE
C2421	ECKR1H102KB1P	C 1000 pF K 50V	D601	RBV406MLFA	DIODE
C2422	ECQB1H681JF3	P 680 pF J 50V	D805	RG2A2LF	DIODE
C2423	ECQB1H681JF3	P 680 pF J 50V	D805	ERA32-02V0	DIODE
			D811	MTZJ2R7BT77	ZENER DIODE
			D812	MTZJ5R1BT77	ZENER DIODE
			D814	MTZJ10BT77	ZENER DIODE
			D830	MTZJ24BT77	ZENER DIODE
			D861	FML-G16SLF	DIODE
			D862	RG2A2LF	DIODE
			D863	ERC90M-03	DIODE
			D864	RN3Z014-305	DIODE
			D865	31DF2-FC	DIODE
			D866	RN3Z014-305	DIODE
			D870	RN3Z014-305	DIODE
			D871	MTZJ6R2BT77	ZENER DIODE
			D872	MTZJ6R2BT77	ZENER DIODE
			D886	31DF2-FC	DIODE
			D901	L-58EGW	LED
			D902	1SS133T77	DIODE
			D903	1SS133T77	DIODE
			D904	1SS133T77	DIODE
			D905	MTZJ5R6BT77	ZENER DIODE
			D908	1N4148TB26	DIODE
			D912	MTZJ5R6BT77	ZENER DIODE
			D916	1SS133T77	DIODE
			D917	1N4148TB26	DIODE
			D918	1SS133T77	DIODE
			D919	1SS133T77	DIODE
			D920	1SS133T77	DIODE
			D930	L-58AD-12.6	LED
			D1001	1SS133T77	DIODE
D11	MA153ATX	DIODE (CHIP)			
D12	MA3150MTX	DIODE (CHIP)			
D13	MA174TX	CHIP DIODE			
D201	MTZJ5R1BT77	ZENER DIODE			
D202	MTZJ5R1BT77	ZENER DIODE			
D203	1N4148TB52	DIODE			
D203	1N4148TB26	DIODE			
D204	1N4148TB52	DIODE			
D204	1N4148TB26	DIODE			
D207	HZT33-09TD	DIODE			
D208	HZT33-09TD	DIODE			
D209	MTZJ12BT77	ZENER DIODE			
D210	MTZJ20CT77	ZENER DIODE			
D232	MTZJ5R1BT77	ZENER DIODE			
D301	1N4001TB26	DIODE			
D303	1N4148TB52	DIODE			
D303	1N4148TB26	DIODE			
D403	MTZJ15BT77	ZENER DIODE			
D404	1N4148TB52	DIODE			
D404	1N4148TB26	DIODE			
D405	MA700TA	DIODE			



REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
D1002	1SS133T77	DIODE	IC1304	LM2931AZ-5T3	IC (3 PIN)
D1005	1SS133T77	DIODE	IC1501	24LC21P	IC (8 PIN)
D1006	MA167ATA5	DIODE	IC2401	LA4270	IC (10 PIN)
D1007	MA167ATA5	DIODE	IC2402	CXA1279AS	IC (22 PIN)
D1101	1SS133T77	DIODE			
D1102	1SS133T77	DIODE			
D1105	1SS133T77	DIODE			
D1106	MA167ATA5	DIODE		COILS	
D1107	MA167ATA5	DIODE			
D1201	1SS133T77	DIODE	L201	TLT331K186T	COIL
D1202	1SS133T77	DIODE	L552	TLX4C6056K01	COIL
D1205	1SS133T77	DIODE	△L553	TLH4C65508D	LINEARITY COIL
D1206	MA167ATA5	DIODE	△L554	TLH85807	CHOKE COIL
D1207	MA167ATA5	DIODE	△L555	TLH4C655927D	BRIDGE COIL
D1301	MTZJ5R6BT77	ZENER DIODE	L556	TLT681K186T	COIL
D1302	MTZJ5R6BT77	ZENER DIODE	L801	SPT0406A102K	COIL
D1303	MTZJ10BT77	ZENER DIODE	△L801	TLP4C65530D	LINE FILTER
D1304	MA700TA	DIODE	L805	EXCELD35V	COIL
D1350	1N4148TB26	DIODE	△L806	TLP4C65530D	LINE FILTER
D1350	1N4148TB52	DIODE	L862	EXCELD35V	COIL
D1351	1SS133T77	DIODE	L863	EXCELD35V	COIL
D1352	MA27WATA	DIODE	L864	EXCELD35V	COIL
D1501	MTZJ5R6BT77	ZENER DIODE	L865	EXCELD35V	COIL
D1502	MTZJ5R6BT77	ZENER DIODE	L866	EXCELD35V	COIL
D1503	MTZJ5R6BT77	ZENER DIODE	L870	EXCELD35V	COIL
D1504	MA700TA	DIODE	L1001	TLT3R9K186T	COIL
D2401	MA7091ATA	DIODE	L1002	TLTR47M186T	COIL
D2402	MTZJ9R1BT77	ZENER DIODE	L1101	TLT3R9K186T	COIL
D2407	1SS133T77	DIODE	L1102	TLTR47M186T	COIL
D2408	1SS133T77	DIODE	L1201	TLT3R9K186T	COIL
D2410	1SS133T77	DIODE	L1202	TLTR47M186T	COIL
D2411	1SS133T77	DIODE	L1302	TLT470K186T	COIL
D2412	MTZJ9R1BT77	ZENER DIODE	L1304	TLT331K186T	COIL
			L1305	TLT101K186T	COIL
			L2301	EXCELD35V	COIL
	IC				
IC201	CXA1616S	IC (22 PIN)		TRANSISTORS	
IC301	TDA8172	IC (7 PIN)			
IC401	TDA9103	IC (42 PIN)			
IC402	LM324MX	CHIP IC (14 PIN)	Q11	2SK1470TD	CHIP MOS
IC403	LM358MX	CHIP IC (8 PIN)	Q12	2SD602QRTX	TRANSISTOR
IC552	LM324MX	CHIP IC (14 PIN)	Q13	2SC4080DETD	CHIP TRANSISTOR
IC701	UPC1406HA	IC (9 PIN)	Q14	2SC4080DETD	CHIP TRANSISTOR
IC702	LM358MX	CHIP IC (8 PIN)	Q15	2SA1575DETD	CHIP TRANSISTOR
IC801	UC3842N	IC (8 PIN)	Q201	H945PTZ	TRANSISTOR
IC862	L78LR05C-TL	CHIP IC (5 PIN)	Q202	H945PTZ	TRANSISTOR
IC863	SE095N	IC (3 PIN)	Q203	H945PTZ	TRANSISTOR
IC864	SI-3240C	IC (5 PIN)	Q204	H945PTZ	TRANSISTOR
IC901	TVC80221-IE	CHIP IC (64 PIN)	Q206	DTC114ESTQ	TRANSISTOR
IC902	MB88346BPFTF	CHIP IC (20 PIN)	Q207	DTC114ESTQ	TRANSISTOR
IC904	NM24C08N	IC (8 PIN)	Q208	2SA1123QRTA	TRANSISTOR
IC1305	MB88346BPFTF	CHIP IC (20 PIN)	Q209	H945PTZ	TRANSISTOR
IC1306	LM324MX	CHIP IC (14 PIN)	Q301	DTC114ESTQ	TRANSISTOR
IC1302	MM74HC4066N	IC (14 PIN)	Q401	DTC114ESTQ	TRANSISTOR
IC1301	LM1207N	IC (28 PIN)	Q402	DTC114ESTQ	TRANSISTOR
IC1303	LSC4230	IC (16 PIN)	Q551	2SC5129	TRANSISTOR

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
Q552	2SK2015TX	CHIP TRANSISTOR		RESISTORS	
Q553	2SK1917F91	MOS F.E.T			
Q554	2SK1917F91	MOS F.E.T	J11	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q555	2SD1266QORRL	TRANSISTOR	J1001	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q556	2SB1322AQRTA	TRANSISTOR	J1002	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q557	DTC114ESTQ	TRANSISTOR	J1003	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q558	DTC114ESTQ	TRANSISTOR	J1004	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q559	2SD2133RSTA	TRANSISTOR	J1005	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q560	2SB1413RSTA	TRANSISTOR	J1006	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q590	2SK1507-91M	F.E.T	J1007	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q801	2SK2148F106	F.E.T.	J1008	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q802	DTC114ESTQ	TRANSISTOR	J1009	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q803	2SA733QR-T	TRANSISTOR	J1010	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q804	2SC4620V25T2	TRANSISTOR	J1011	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q805	DTC114ESTQ	TRANSISTOR	J1012	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q807	2SA1577RT106	CHIP TRANSISTOR	J1013	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q808	2SC4081RT106	CHIP TRANSISTOR	J1014	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q809	2SA733QR-T	TRANSISTOR	J1015	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q810	2SA1577RT106	CHIP TRANSISTOR	J1016	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q811	2SC1318RTA	TRANSISTOR	J1017	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q850	2SB1414RSTA	TRANSISTOR	J1018	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q851	2SC1473RTA	TRANSISTOR	J1019	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q861	2SA733QR-T	TRANSISTOR	J1020	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q862	2SA733QR-T	TRANSISTOR	J1021	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q863	2SC1162CD	TRANSISTOR	J1022	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q864	DTC114ESTQ	TRANSISTOR	J1023	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q865	2SB649AC	TRANSISTOR	J1024	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q866	DTC114ESTQ	TRANSISTOR	J1025	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q867	2SB857WC	TRANSISTOR	J1026	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q867	2SB857WC	TRANSISTOR	J1027	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q868	H945PTZ	TRANSISTOR	J1028	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q870	DTC114ESTQ	TRANSISTOR	J1029	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q871	2SB1202RS-TL	CHIP TRANSISTOR	J1030	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q872	2SA733QR-T	TRANSISTOR	J1031	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q873	2SC1473QRTA	TRANSISTOR	J1032	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q881	DTC114ESTQ	TRANSISTOR	J1033	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q882	DTC114ESTQ	TRANSISTOR	J1034	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q883	2SD1992AQRTA	TRANSISTOR	J1035	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q884	2SB1321AQRTA	TRANSISTOR	J1036	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q885	2SK1917F91	MOS F.E.T	J1037	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q902	DTA114ESTQ	TRANSISTOR	J1038	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q903	DTC114ESTQ	TRANSISTOR	J1039	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q904	DTA114ESTQ	TRANSISTOR	J1040	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q1002	2SC4693	TRANSISTOR	J1041	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q1003	2SC4934E	TRANSISTOR	J1042	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q1102	2SC4693	TRANSISTOR	J1043	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
Q1103	2SC4934E	TRANSISTOR	R11	ERJ6ENF1002VT	T 10K $\Omega$ F 1/10W
Q1202	2SC4693	TRANSISTOR	R12	ERJ6ENF4703VT	T 470K $\Omega$ F 1/10W
Q1203	2SC4934E	TRANSISTOR	R13	ERJ6ENF1002VT	T 10K $\Omega$ F 1/10W
Q1301	2SC3811RTA	TRANSISTOR	R14	ERJ6ENF3301VT	T 3.3K $\Omega$ F 1/10W
Q1302	2SC3811RTA	TRANSISTOR	R15	TAR101D0183H	T 18K $\Omega$ 10W
Q1303	DTC114ESTQ	TRANSISTOR	R16	ERJ6ENF6800VT	T 680 $\Omega$ F 1/10W
Q1304	2SA733QR-T	TRANSISTOR	R18	TAR101D0273H	T 27K $\Omega$ 10W
Q1305	2SA733QR-T	TRANSISTOR	R19	ERJ6ENF4702VT	T 47K $\Omega$ F 1/10W
			R20	ERJ6ENF4702VT	T 47K $\Omega$ F 1/10W
			R22	ERJ6GEY0R00VT	T 0 $\Omega$ 1/10W
			R23	ERJ6GEY1005VT	T 1M $\Omega$ J 1/10W

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
R24	ERJ6ENF4703VT	T 470KΩ F 1/10W	R351	ERJ6GEYJ562VT	T 5.6KΩ J 1/10W
R25	ERJ6ENF1000VT	T 100Ω F 1/10W	R352	ERJ6GEYJ103VT	T 10KΩ J 1/10W
R201	ERJ6GEYJ471VT	T 470Ω J 1/10W	R353	ERJ6GEYJ562VT	T 5.6KΩ J 1/10W
R202	ERD25TJ102TT	C 1KΩ J 1/4W	R354	ERDS2TJ103TT	C 1KΩ J 1/4W
R203	ERJ6GEYJ104VT	T 100KΩ J 1/10W	R355	ERJ6GEYJ562VT	T 5.6KΩ J 1/10W
R205	ERDS2TJ271TT	C 270Ω J 1/4W	R356	ERJ6GEYJ103VT	T 10KΩ J 1/10W
R206	ERJ6GEYJ123VT	T 12KΩ J 1/10W	R357	ERDS2TJ103TT	C 1KΩ J 1/4W
R207	ERJ6GEYJ392VT	T 3.9KΩ J 1/10W	R358	ERDS2TJ392TT	C 3.9KΩ J 1/4W
R208	ERJ6GEYJ682VT	T 6.8KΩ J 1/10W	R359	ERDS2TJ103TT	C 1KΩ J 1/4W
R209	ERJ6GEYJ392VT	T 3.9KΩ J 1/10W	R360	ERJ6GEYJ103VT	T 10KΩ J 1/10W
R210	ERDS2TJ222TT	C 2.2KΩ J 1/4W	R361	ERJ6GEYJ562VT	T 5.6KΩ J 1/10W
R211	ERDS2TJ122TT	C 1.2KΩ J 1/4W	R362	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W
R212	ERJ6GEYJ122VT	T 1.2KΩ J 1/10W	R363	ERJ6GEYJ103VT	T 10KΩ J 1/10W
R213	ERJ6GEYJ223VT	T 22KΩ J 1/10W	R401	ERJ6GEYJ822VT	T 8.2KΩ J 1/10W
R214	ERDS2TJ223TT	C 22KΩ J 1/4W	R402	ERJ6GEYJ393VT	T 39KΩ J 1/10W
R215	ERJ6GEYJ222VT	T 2.2KΩ J 1/10W	R403	ERD25TJ103TT	C 10KΩ J 1/4W
R216	ERJ6GEYJ102VT	T 1KΩ J 1/10W	R404	ERJ6GEYJ100VT	T 10Ω J 1/10W
R217	ERJ6GEYJ102VT	T 1KΩ J 1/10W	R405	ERJ6ENF7501VT	T 7.5KΩ F 1/10W
R218	ERDS2TJ103TT	C 1KΩ J 1/4W	R406	ERDS2TJ222TT	C 2.2KΩ J 1/4W
R219	ERDS2TJ272TT	C 2.7KΩ J 1/4W	R410	ERJ6GEYJ393VT	T 39KΩ J 1/10W
R220	ERDS2TJ392TT	C 3.9KΩ J 1/4W	R412	ERJ6ENF1242VT	T 12.4KΩ F 1/10W
R221	ERJ6GEYJ223VT	T 22KΩ J 1/10W	R413	ERJ6ENF2322VT	T 23.2KΩ F 1/10W
R223	ERJ6ENF2152VT	T 21.5KΩ F 1/10W	R414	ERJ6GEYJ103VT	T 10KΩ J 1/10W
R224	ERDS1TJ103TT	C 10KΩ J 1/2W	R415	ERDS2TJ562TT	C 5.6KΩ J 1/4W
R225	ERDS2TJ102TT	C 1KΩ J 1/4W	R416	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W
R226	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W	R417	ERD25TJ273TT	C 27KΩ J 1/4W
R227	ERDS2TJ104TT	C 100KΩ J 1/4W	R418	ERDS2TJ821TT	C 820Ω J 1/4W
R228	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W	R419	ERJ6GEYJ333VT	T 33KΩ J 1/10W
R229	ERJ6GEYJ102VT	T 1KΩ J 1/10W	R420	ERJ6GEYJ554VT	T 560KΩ J 1/10W
R230	ERJ6ENF6492VT	T 64.9KΩ F 1/10W	R421	ERJ6GEYJ103VT	T 10KΩ J 1/10W
R231	EROS2TKF1502T	M 15KΩ F 1/4W	R422	ERJ6GEYJ102VT	T 1KΩ J 1/10W
R233	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W	R423	ERJ6GEYJ562VT	T 5.6KΩ J 1/10W
R234	ERJ6GEYJ681VT	T 680Ω J 1/10W	R424	ERJ6GEYJ224VT	T 220KΩ J 1/10W
R235	ERJ6GEYJ332VT	T 3.3KΩ J 1/10W	R425	ERJ6GEYJ153VT	T 15KΩ J 1/10W
R236	ERDS1TJ580TT	C 68Ω J 1/2W	R426	ERJ6GEYJ223VT	T 22KΩ J 1/10W
R237	ERDS2TJ223TT	C 22KΩ J 1/4W	R427	ERJ6GEYJ183VT	T 18KΩ J 1/10W
R238	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R540	ERX3SJ3R9ST	M 3.9Ω J 3W
R301	ERDS2TJ123TT	C 12KΩ J 1/4W	R541	ERX3SJ3R9ST	M 3.9Ω J 3W
R302	ERJ6ENF4531VT	T 4.53KΩ F 1/10W	R550	ERG3FJX270E	M 27Ω J 3W
R303	ERJ6ENF2432VT	T 24.3KΩ F 1/10W	R551	ERDS1TJ470TT	C 47Ω J 1/2W
R305	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W	R552	ERJ6GEYJ332VT	T 3.3KΩ J 1/10W
R307	ERDS2TJ123TT	C 12KΩ J 1/4W	R553	ERG1SJW561E	M 560Ω J 1W
R308	ERDS2TJ103TT	C 1KΩ J 1/4W	R554	ERX2SJW1R2E	M 1.2Ω J 2W
R309	ERDS1TJ333TT	C 33KΩ J 1/2W	R555	ERX2SJW1R0E	M 1Ω J 2W
R310	ERJ6GEYJ123VT	T 12KΩ J 1/10W	R556	ERX2SJW6R8ST	M 6.8Ω J 2W
R311	ERJ6GEYJ682VT	T 6.8KΩ J 1/10W	R557	ERX3FJX6R8E	M 6.8Ω J 3W
R312	ERDS1TJ183TT	C 18KΩ J 1/2W	R558	ERJ6GEYJ562VT	T 5.6KΩ J 1/10W
R313	ERDS2TJ1R0TT	C 1Ω J 1/4W	R559	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W
R314	ERG1SJW221E	M 220Ω J 1W	R560	ERDS1TJ271TT	C 270Ω J 1/2W
R315	ERX1SJW1R0E	M 1Ω J 1W	R561	TARRS5B150J2	M 15Ω J 5W
R316	ERJ6GEYJ471VT	T 470Ω J 1/10W	R562	TARRS5B150J2	M 15Ω J 5W
R317	ERDS2TJ103TT	C 1KΩ J 1/4W	R563	ERJ6GEYJ332VT	T 3.3KΩ J 1/10W
R318	ERD25TJ103TT	C 10KΩ J 1/4W	R564	ERDS1TJ471TT	C 470Ω J 1/2W
R319	ERJ6GEYJ392VT	T 3.9KΩ J 1/10W	R565	ERDS1TJ471TT	C 470Ω J 1/2W
R320	ERJ6GEYJ273VT	T 27KΩ J 1/10W	R566	ERJ6GEYJ100VT	T 10Ω J 1/10W
R350	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R567	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W



REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
R568	ERDS2TJ100TT	C 10 Ω J 1/4W	R809	ERDS1TJ224TT	C 220K Ω J 1/2W
R569	ERDS2TJ472TT	C 4.7K Ω J 1/4W	R810	ERG2SJW333E	M 33K Ω J 2W
R570	ERDS1TJ472TT	C 4.7K Ω J 1/2W	R811	ERG2SJW333E	M 33K Ω J 2W
R571	ERDS1TJ472TT	C 4.7K Ω J 1/2W	R812	ERJ5GEYJ472VT	T 4.7K Ω J 1/10W
R572	ERX2SJW2R7E	M 2.7 Ω J 2W	R813	ERJ5GEYJ472VT	T 4.7K Ω J 1/10W
R575	ERD25TJ272TT	C 2.7K Ω J 1/4W	R815	ERG3FJX473E	M 47K Ω J 3W
R576	ERJ6GEYJ582VT	T 6.8K Ω J 1/10W	R816	ERQ14AJW220E	F 22 Ω J 1/4W
R577	ERDS2TJ472TT	C 4.7K Ω J 1/4W	R817	ERJ6GEYJ223VT	T 22K Ω J 1/10W
R578	ERJ6GEYJ333VT	T 33K Ω J 1/10W	R818	ERX3FJXR22E	M 0.22 Ω J 3W
R580	ERJ6GEYJ222VT	T 2.2K Ω J 1/10W	R819	ERDS2TJ222TT	C 2.2K Ω J 1/4W
R581	ERD25TJ222TT	C 2.2K Ω J 1/4W	R820	ERX3SJR22H	M 0.22 Ω J 3W
R582	ERDS2TJ333TT	C 33K Ω J 1/4W	R821	ERJ6GEYJ332VT	T 3.3K Ω J 1/10W
R583	ERJ6GEYJ103VT	T 10K Ω J 1/10W	R822	ERJ6GEYJ332VT	T 3.3K Ω J 1/10W
R584	ERJ6GEYJ222VT	T 2.2K Ω J 1/10W	R823	ERJ5ENF8202VT	T 8.2K Ω F 1/10W
R585	ERJ6GEYJ103VT	T 10K Ω J 1/10W	R824	ERDS2TJ470TT	C 47 Ω J 1/4W
R586	ERJ6GEYJ332VT	T 3.3K Ω J 1/10W	R825	ERX3FJXR22E	M 0.22 Ω J 3W
R587	ERDS2TJ153TT	C 15K Ω J 1/4W	R826	ERDS2TJ103TT	C 1K Ω J 1/4W
R588	ERJ6GEYJ472VT	T 4.7K Ω J 1/10W	R827	ERJ6GEYJ582VT	T 6.8K Ω J 1/10W
R589	ERD25TJ822TT	C 8.2K Ω J 1/4W	R828	ERDS1TJ274TT	C 270K Ω J 1/2W
R590	ERDS2TJ222TT	C 2.2K Ω J 1/4W	R829	ERDS2TJ223TT	C 22K Ω J 1/4W
R591	ERDS2TJ182TT	C 1.8K Ω J 1/4W	R830	ERDS2TJ220TT	C 22 Ω J 1/4W
R592	ERD25TJ273TT	C 27K Ω J 1/4W	R831	ERDS1TJ334TT	C 330K Ω J 1/2W
R593	ERJ6GEYJ223VT	T 22K Ω J 1/10W	R832	ERDS2TJ224TT	C 220K Ω J 1/4W
R594	ERJ6GEYJ273VT	T 27K Ω J 1/10W	R833	ERDS2TJ224TT	C 220K Ω J 1/4W
R595	ERJ6GEYJ103VT	T 10K Ω J 1/10W	R834	ERJ6GEYJ472VT	T 4.7K Ω J 1/10W
R596	ERJ6GEYJ582VT	T 6.8K Ω J 1/10W	R836	ERJ6GEYJ472VT	T 4.7K Ω J 1/10W
R597	ERJ6GEYJ222VT	T 2.2K Ω J 1/10W	R837	ERJ6GEYJ122VT	T 1.2K Ω J 1/10W
R598	ERJ6GEYJ222VT	T 2.2K Ω J 1/10W	R838	ERJ6GEYJ581VT	T 680 Ω J 1/10W
R599	ERJ6GEYJ582VT	T 6.8K Ω J 1/10W	R839	ERJ6GEYJ582VT	T 6.8K Ω J 1/10W
R601	ERJ6ENF1553VT	T 165K Ω F 1/10W	R840	ERDS2TJ222TT	C 2.2K Ω J 1/4W
R602	ERJ6ENF1553VT	T 165K Ω F 1/10W	△ R844	ERQ12AJR47HK	F 0.47 Ω J 1/2W
R603	ERD25TJ100TT	C 10 Ω J 1/4W	R850	ERDS2TJ473TT	C 47K Ω J 1/4W
R604	ERDS1TJ272TT	C 2.7K Ω J 1/2W	R851	ERG1SJW393E	M 39K Ω J 1W
R605	ERJ6GEYJ1R0VT	T 1 Ω J 1/10W	R852	ERD25TJ103TT	C 10K Ω J 1/4W
R606	EROS2TKF8252T	M 82.5K Ω F 1/4W	R853	ERDS2TJ103TT	C 1K Ω J 1/4W
R607	ERJ6GEYJ562VT	T 5.6K Ω J 1/10W	R860	ERDS1TJ473TT	C 47K Ω J 1/2W
R610	EROS2TKF8252T	M 82.5K Ω F 1/4W	R861	ERX3FJX4R7E	M 4.7 Ω J 3W
R701	ERDS2TJ683TT	C 68K Ω J 1/4W	R862	ERDS1TJ563TT	C 56K Ω J 1/2W
R702	ERJ6GEYJ154VT	T 150K Ω J 1/10W	△ R863	ERQ12AJR47HK	F 0.47 Ω J 1/2W
R703	ERJ6GEYJ103VT	T 10K Ω J 1/10W	△ R864	ERQ12AJR47HK	F 0.47 Ω J 1/2W
R704	ERJ6GEYJ583VT	T 68K Ω J 1/10W	△ R865	ERQ12AJR47HK	F 0.47 Ω J 1/2W
R707	ERJ6GEYJ104VT	T 100K Ω J 1/10W	△ R866	ERQ12AJR47HK	F 0.47 Ω J 1/2W
R708	ERDS2TJ104TT	C 100K Ω J 1/4W	R867	ERX3FJX5R6E	M 5.6 Ω J 3W
R709	ERJ6GEY0R00VT	T 0 Ω 1/10W	R868	ERX1SJW1R0E	M 1 Ω J 1W
R710	ERDS2TJ333TT	C 33K Ω J 1/4W	R869	ERJ6GEYJ223VT	T 22K Ω J 1/10W
R711	ERJ6GEYJ103VT	T 10K Ω J 1/10W	R870	ERJ6GEYJ103VT	T 10K Ω J 1/10W
R712	ERJ6GEYJ103VT	T 10K Ω J 1/10W	R872	ERJ6GEYJ271VT	T 270 Ω J 1/10W
R713	ERJ6GEYJ153VT	T 15K Ω J 1/10W	R873	ERDS1TJ221TT	C 220 Ω J 1/2W
R714	ERDS2TJ104TT	C 100K Ω J 1/4W	R874	ERDS1TJ221TT	C 220 Ω J 1/2W
R717	ERDS2TJ122TT	C 1.2K Ω J 1/4W	R875	ERJ6GEYJ582VT	T 6.8K Ω J 1/10W
R801	ERC12AGK394D	S 390K Ω K 1/2W	R876	ERDS2TJ103TT	C 1K Ω J 1/4W
△ R802	TAP101N016	F 18 Ω 10W	R877	ERDS2TJ563TT	C 56K Ω J 1/4W
△ R803	ERTD6ZFL20P	THERMISTOR	R878	ERJ6GEYJ102VT	T 1K Ω J 1/10W
R804	ERJ6GEYJ472VT	T 4.7K Ω J 1/10W	R880	ERJ6GEYJ562VT	T 5.6K Ω J 1/10W
R805	ERJ6GEYJ561VT	T 560 Ω J 1/10W	R881	ERJ6GEYJ102VT	T 1K Ω J 1/10W
R808	ERDS1TJ224TT	C 220K Ω J 1/2W	R882	ERDS1TJ120TT	C 12 Ω J 1/2W

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
R863	ERDS2TJ104TT	C 100KΩ J 1/4W	R953	ERDS2TJ223TT	C 22KΩ J 1/4W
R864	ERJ6GEYJ102VT	T 1KΩ J 1/10W	R954	ERJ6GEYJ223VT	T 22KΩ J 1/10W
R865	ERX3FJXR56E	M 0.56Ω J 5W	R955	ERJ6GEYJ223VT	T 22KΩ J 1/10W
R866	ERDS1TJ332TT	C 3.3KΩ J 1/2W	R956	ERDS2TJ331TT	C 330Ω J 1/4W
R867	ERDS2TJ102TT	C 1KΩ J 1/4W	R957	ERJ6GEYJ563VT	T 56KΩ J 1/10W
R868	ERDS2TJ472TT	C 4.7KΩ J 1/4W	R1000	ERDS2TJ103TT	C 1KΩ J 1/4W
R869	ERDS2TJ392TT	C 3.9KΩ J 1/4W	R1001	ERO25TKF75R0T	M 75Ω F 1/4W
R890	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R1002	ERDS2TJ330TT	C 33Ω J 1/4W
R892	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R1003	ERDS2TJ103TT	C 1KΩ J 1/4W
R893	ERD25FVJ222C	C 2.2KΩ J 1/4W	R1005	ERDS2TJ472TT	C 4.7KΩ J 1/4W
R894	ERJ6GEYJ102VT	T 1KΩ J 1/10W	R1009	EROS2TKF2870T	M 287Ω F 1/4W
R900	ERDS2TJ103TT	C 1KΩ J 1/4W	R1011B	ERG5SJ182ST	M 1.8KΩ J 5W
R901	ERDS2TJ152TT	C 1.5KΩ J 1/4W	R1011A	ERG5SJ182ST	M 1.8KΩ J 5W
R902	ERDS2TJ152TT	C 1.5KΩ J 1/4W	R1012	ERDS1TJ472TT	C 4.7KΩ J 1/2W
R903	ERJ6GEYJ152VT	T 1.5KΩ J 1/10W	R1014B	ERG1SJW101E	M 100Ω J 1W
R904	ERDS1VJ562TT	C 5.6KΩ J 1/2W	R1014A	ERG1SJ101V	M 100Ω J 1W
R905	ERDS2TJ562TT	C 5.6KΩ J 1/4W	R1015	ERDS2TJ390TT	C 39Ω J 1/4W
R906	ERDS2TJ562TT	C 5.6KΩ J 1/4W	R1016	ERDS2TJ104TT	C 100KΩ J 1/4W
R907	ERDS2TJ101TT	C 100Ω J 1/4W	R1019	ERDS2TJ181TT	C 180Ω J 1/4W
R908	ERJ6GEYJ102VT	T 1KΩ J 1/10W	R1020	ERDS1TJ330TT	C 33Ω J 1/2W
R909	ERDS2TJ102TT	C 1KΩ J 1/4W	R1021	ERDS1TJ391TT	C 390Ω J 1/2W
R910	ERDS2TJ102TT	C 1KΩ J 1/4W	R1030B	ERG1SJW101E	M 100Ω J 1W
R911	ERDS2TJ101TT	C 100Ω J 1/4W	R1030A	ERG1SJ101V	M 100Ω J 1W
R912	ERDS2TJ223TT	C 22KΩ J 1/4W	R1100	ERD25TJ103TT	C 10KΩ J 1/4W
R913	ERDS2TJ103TT	C 1KΩ J 1/4W	R1101	ERO25TKF75R0T	M 75Ω F 1/4W
R914	ERDS2TJ392TT	C 3.9KΩ J 1/4W	R1102	ERDS2TJ330TT	C 33Ω J 1/4W
R916	ERDS2TJ333TT	C 33KΩ J 1/4W	R1103	ERDS2TJ103TT	C 1KΩ J 1/4W
R920	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R1105	ERDS2TJ472TT	C 4.7KΩ J 1/4W
R921	ERJ6GEYJ563VT	T 56KΩ J 1/10W	R1109	EROS2TKF2870T	M 287Ω F 1/4W
R922	ERJ6GEYJ563VT	T 56KΩ J 1/10W	R1111B	ERG5SJ182ST	M 1.8KΩ J 5W
R923	ERJ6GEYJ563VT	T 56KΩ J 1/10W	R1111A	ERG5SJ182ST	M 1.8KΩ J 5W
R924	ERJ6GEYJ563VT	T 56KΩ J 1/10W	R1112	ERDS1TJ472TT	C 4.7KΩ J 1/2W
R925	ERJ6GEYJ223VT	T 22KΩ J 1/10W	R1114A	ERG1SJW101E	M 100Ω J 1W
R926	ERJ6GEYJ223VT	T 22KΩ J 1/10W	R1114B	ERG1SJW101E	M 100Ω J 1W
R927	ERJ6GEYJ223VT	T 22KΩ J 1/10W	R1115	ERDS2TJ470TT	C 47Ω J 1/4W
R928	ERJ6GEYJ223VT	T 22KΩ J 1/10W	R1116	ERDS2TJ104TT	C 100KΩ J 1/4W
R929	ERDS2TJ101TT	C 100Ω J 1/4W	R1119	ERDS2TJ331TT	C 330Ω J 1/4W
R930	ERJ6GEYJ101VT	T 100Ω J 1/10W	R1120	ERDS1TJ330TT	C 33Ω J 1/2W
R931	ERJ6GEYJ101VT	T 100Ω J 1/10W	R1121	ERDS1TJ391TT	C 390Ω J 1/2W
R932	ERDS2TJ331TT	C 330Ω J 1/4W	R1130B	ERG1SJW101E	M 100Ω J 1W
R933	ERDS2TJ331TT	C 330Ω J 1/4W	R1130A	ERG1SJW101E	M 100Ω J 1W
R934	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R1200	ERD25TJ103TT	C 10KΩ J 1/4W
R935	ERDS2TJ102TT	C 1KΩ J 1/4W	R1201	ERO25TKF75R0T	M 75Ω F 1/4W
R936	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R1202	ERDS2TJ330TT	C 33Ω J 1/4W
R937	ERJ6GEYJ103VT	T 10KΩ J 1/10W	R1203	ERDS2TJ103TT	C 1KΩ J 1/4W
R938	ERJ6GEYJ472VT	T 4.7KΩ J 1/10W	R1205	ERDS2TJ472TT	C 4.7KΩ J 1/4W
R940	ERDS2TJ101TT	C 100Ω J 1/4W	R1209	EROS2TKF2870T	M 287Ω F 1/4W
R941	ERDS2TJ101TT	C 100Ω J 1/4W	R1211B	ERG5SJ182ST	M 1.8KΩ J 5W
R942	EROS2TKF2553T	M 255KΩ F 1/4W	R1211A	ERG5SJ182ST	M 1.8KΩ J 5W
R943	EROS2TKF1001T	M 1KΩ F 1/4W	R1212	ERDS1TJ472TT	C 4.7KΩ J 1/2W
R944	ERJ6ENF2553VT	T 255KΩ F 1/10W	R1214A	ERG1SJW101E	M 100Ω J 1W
R945	ERJ6ENF1001VT	T 1KΩ F 1/10W	R1214B	ERG1SJ101V	M 100Ω J 1W
R949	ERDS2TJ222TT	C 2.2KΩ J 1/4W	R1215	ERDS2TJ470TT	C 47Ω J 1/4W
R950	ERD25TJ104TT	C 100KΩ J 1/4W	R1216	ERDS2TJ104TT	C 100KΩ J 1/4W
R951	ERDS2TJ563TT	C 56KΩ J 1/4W	R1219	ERDS2TJ221TT	C 220Ω J 1/4W
R952	ERJ6GEYJ563VT	T 56KΩ J 1/10W	R1220	ERDS1TJ330TT	C 33Ω J 1/2W

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
R1221	ERDS1TJ391TT	C 390 Ω J 1/2W	R1505	ERDS2TJ331TT	C 330 Ω J 1/4W
R1230B	ERG1SJ101V	M 100 Ω J 1W	R1506	ERDS2TJ103TT	C 1K Ω J 1/4W
R1230A	ERG1SJW101E	M 100 Ω J 1W	R2301	ERDS2TJ102TT	C 1K Ω J 1/4W
R1301	ERDS2TJ622TT	C 8.2K Ω J 1/4W	R2302	ERDS2TJ102TT	C 1K Ω J 1/4W
R1302	ERDS2TJ472TT	C 4.7K Ω J 1/4W	R2303	ERDS1VJ2R2TT	C 2.2 Ω J 1/2W
R1303	ERDS2TJ330TT	C 33 Ω J 1/4W	R2304	ERDS1VJ2R2TT	C 2.2 Ω J 1/2W
R1304	ERDS1TJ681TT	C 680 Ω J 1/2W	R2305	ERDS2TJ471TT	C 470 Ω J 1/4W
R1307	ERDS2TJ102TT	C 1K Ω J 1/4W	R2306	ERDS2TJ471TT	C 470 Ω J 1/4W
R1308	ERDS2TJ102TT	C 1K Ω J 1/4W	R2307	ERDS2TJ471TT	C 470 Ω J 1/4W
R1309	ERDS2TJ102TT	C 1K Ω J 1/4W	R2308	ERDS2TJ471TT	C 470 Ω J 1/4W
R1310	ERDS2TJ102TT	C 1K Ω J 1/4W	R2309	ERX3FJX3R3E	M 3.3 Ω J 3W
R1311	ERDS2TJ102TT	C 1K Ω J 1/4W	R2310	ERX3FJX3R3E	M 3.3 Ω J 3W
R1312	ERDS2TJ103TT	C 1K Ω J 1/4W	R2401	ERDS2TJ103TT	C 1K Ω J 1/4W
R1313	ERDS2TJ332TT	C 3.3K Ω J 1/4W	R2402	ERDS2TJ683TT	C 68K Ω J 1/4W
R1314	EROS2TKF9091T	M 9.09K Ω F 1/4W	R2403	ERDS2TJ103TT	C 1K Ω J 1/4W
R1315	ERDS2TJ222TT	C 2.2K Ω J 1/4W	R2404	ERDS2TJ683TT	C 68K Ω J 1/4W
R1316	ERDS2TJ474TT	C 470K Ω J 1/4W	R2405	EROS2TKF4021T	M 4.02K Ω F 1/4W
R1317	ERDS2TJ102TT	C 1K Ω J 1/4W	R2406	EROS2TKF3901T	M 3.9K Ω F 1/4W
R1318	ERD25TJ151TT	C 150 Ω J 1/4W	R2407	EROS2TKF4021T	M 4.02K Ω F 1/4W
R1319	ERDS1TJ273TT	C 27K Ω J 1/2W	R2408	EROS2TKF1002T	M 10K Ω F 1/4W
R1320	ERDS2TJ152TT	C 1.5K Ω J 1/4W	R2409	ERDS2TJ102TT	C 1K Ω J 1/4W
R1321	ERDS2TJ822TT	C 8.2K Ω J 1/4W	R2410	ERDS2TJ102TT	C 1K Ω J 1/4W
R1323	ERDS2TJ100TT	C 10 Ω J 1/4W	R2411	EROS2TKF6651T	M 6.65K Ω F 1/4W
R1324	ERDS2TJ161TT	C 160 Ω J 1/4W	R2412	EROS2TKF2611T	M 2.61K Ω F 1/4W
R1326	ERDS2TJ473TT	C 47K Ω J 1/4W	R2413	ERDS2TJ102TT	C 1K Ω J 1/4W
R1327	ERDS2TJ473TT	C 47K Ω J 1/4W	R2414	ERG2SJW331E	M 330 Ω J 2W
R1328	ERDS2TJ221TT	C 220 Ω J 1/4W	R2415	ERDS2TJ822TT	C 8.2K Ω J 1/4W
R1329	ERDS1TJ101TT	C 100 Ω J 1/2W	R2416	ERDS2TJ222TT	C 2.2K Ω J 1/4W
R1330	ERDS1TJ560TT	C 56 Ω J 1/2W	R2417	ERDS2TJ562TT	C 5.6K Ω J 1/4W
R1331	ERDS1TJ101TT	C 100 Ω J 1/2W	R2418	ERDS2TJ682TT	C 6.8K Ω J 1/4W
R1332	ERDS1TJ100TT	C 10 Ω J 1/2W	R2420	ERX3FJX3R9E	M 3.9 Ω J 3W
R1334	ERD25TJ331TT	C 330 Ω J 1/4W			
R1335	EXCELSR35T	COIL			
R1351	ERJ6GEYJ103VT	T 10K Ω J 1/10W			
R1352	ERJ6GEYJ103VT	T 10K Ω J 1/10W			
R1353	ERJ6GEYJ103VT	T 10K Ω J 1/10W			
R1354	ERJ6GEYJ103VT	T 10K Ω J 1/10W			
R1355	ERJ6GEYJ103VT	T 10K Ω J 1/10W			
R1356	ERJ6ENF5621VT	T 5.62K Ω F 1/10W			
R1357	ERJ6GEYJ103VT	T 10K Ω J 1/10W			
R1358	ERJ6GEYJ683VT	T 68K Ω J 1/10W			
R1359	ERDS2TJ153TT	C 15K Ω J 1/4W			
R1360	ERJ6GEYJ392VT	T 3.9K Ω J 1/10W			
R1361	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1362	ERDS2TJ331TT	C 330 Ω J 1/4W			
R1372	EROS2TKF2102T	M 21K Ω F 1/4W			
R1373	ERJ6ENF2702VT	T 27K Ω F 1/10W			
R1374	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1375	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1376	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1377	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1378	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1379	ERJ6GEYJ102VT	T 1K Ω J 1/10W			
R1501	ERDS2TJ471TT	C 470 Ω J 1/4W			
R1503	ERDS2TJ331TT	C 330 Ω J 1/4W			
R1504	ERDS2TJ473TT	C 47K Ω J 1/4W			

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
	TRANSFORMERS		TP1	TEL302-9	TERMINAL (GT PIN)
△T541	TLH4C65407D	SWITCHING DRIVE TRANS.	VR551	EVNDCAA03B53	VR. 5K Ω B
△T601	TLF4C64717M	FLYBACK TRANSFORMER	X901	HC49U805	8.0MHZ OSC
△T801	TLP55237R	SWITCHING TRANS.	Z1061	TAX10125	LC FILTER
△T881	TLP4C65127C	CHOKE COIL	Z1161	TAX10125	LC FILTER
	OTHERS		Z1261	TAX10125	LC FILTER
CL1	TMM4C0083	LEAD CLAMPER	Z1361	TAXZJSR102T	LC FILTER
CL2	TMM16452	CLAMPER	Z1362	TAXZJSR102T	LC FILTER
△F801	XBA215T4.0AH	AC FUSE(T4AH/250V)	TMK4C0039	MICA SHEET	
FG1	TJE4C0010	EARTH PLATE	TMM6428-1	LEAD CLAMPER	
FG2	TJE4C0010	EARTH PLATE	TUC4C0074-11	HEAT SINK	
FG3	TJC85341	EARTH LOCK	TUC4C0100	HEAT SINK	
FG4	TJC85341	EARTH LOCK	TUC4C0116-1	HEAT SINK	
FG801	TJC85341	EARTH LOCK	TUC4C0117-1	HEAT SINK	
FG802	TJC85341	EARTH LOCK	TUC4C0117-2	HEAT SINK	
FG803	TJC85341	EARTH LOCK	TUC81634-7T	HEAT SINK	
FS801	TJC85502T	FUSE HOLDER	TUC85829T	HEAT SINK	
FS802	TJC85502T	FUSE HOLDER	TUC87574T	AC INLET METAL	
J1	TXAJT1P1D1562	1P TERMINAL WIRE	TUC87668T	HEAT SINK	
JK1	TJS9A8440	JACK	TUCC5010T	D-SUB CONN. SHIELD CASE	
JK2	TJS9A8440	JACK	TWE8202009ELT	1P TERMINAL WIRE	
JK3	TJS9A8760	JACK	XTV3+10C	SCREW	
JK4	TJS9A8780	PIN JACK	XWG3F10	WASHER	
N1	TJS2541-07YN5	7P BASE	XWGT40660	WASHER	
N2	TJS9A864A	15 PIN D-SUB BASE			
N3	TJS878306	6P BASE			
N4	TJS878303	3P BASE			
N7	TJS878207	7P BASE			
N8	TJS878204	4P BASE			
N14	TJEP128G02M	CHIP 2P BASE			
N15	TJEP128G03M	CHIP 3P BASE			
N16	TJEP128G04M	CHIP 4P BASE			
N101A-	TXAJT12P11562	12P CONNECTOR			
N101B	TJS878212	12P BASE			
N102A-	TXAJT11P11562	11P CONNECTOR			
N102B	TJS878211	11P BASE			
△N103	TJS4C6A501	CRT SOCKET			
N104	TEL302-9	TERMINAL (GT PIN)			
N105-1	TEL302-9	TERMINAL (GT PIN)			
N105-2	TEL302-9	TERMINAL (GT PIN)			
N105-3	TEL302-9	TERMINAL (GT PIN)			
N105-4	TEL302-9	TERMINAL (GT PIN)			
N106	EMCS0451ML	4P BASE			
N107	TJS878203	3P BASE			
N108	TJS878206	6P BASE			
N110-1	TEL302-9	TERMINAL (GT PIN)			
N110-2	TEL302-9	TERMINAL (GT PIN)			
△N801	TJT4C6601T	AC INLET(SS-120,10A)			
N803-1	TEL302-9	TERMINAL (GT PIN)			
N803-2	TEL302-9	TERMINAL (GT PIN)			
N804	TXAJTC7P152T	7P CONNECTOR			
N9	TJS878202J	2P BASE			
N900	TJS878203	3P BASE			
△PC801	TLP721FD4GRH	PHOTO COUPLER P721F			

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## 1. CAUTION

No modification of any circuit should be attempted. Service work should be performed only after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

## 2. SAFETY CHECK

Care should be taken while servicing this CRT display because of the high voltage used in the deflection circuits. These voltages are exposed in such areas as the associated flyback and yoke circuits.

## 3. FIRE AND SHOCK HAZARD

- 3.1 Insert an isolation transformer between the CRT display and AC power line before servicing the chassis.
- 3.2 While servicing, specially in the high voltage circuit, pay attention to the original lead dress. If a short circuit is found, replace all parts which have overheated as a result of the short circuit.
- 3.3 All the protective devices must be reinstalled per the original design.
- 3.4 Soldering must be inspected for possible cold solder joints, frayed leads, damaged insulation, solder splashes or sharp solder points. Be certain to remove all foreign material.

## 4. LEAKAGE CURRENT COLD CHECK

- 4.1 Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 4.4 Turn the CRT display power switch "on".
- 4.3 Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metallic part on the CRT display such as the metal frame, screwheads, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be 18 megohm minimum.

## 5. LEAKAGE CURRENT HOT CHECK

- 5.1 Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during this check.
- 5.2 Connect a 1500 ohm, 10 watt resistor, parallel a 0.15  $\mu$  F capacitor between each exposed metallic part and a good earth ground (as shown in Fig 1).
- 5.3 Use an AC voltmeter with 1000 ohm/volt or more sensitivity and measure the AC voltage across the combination 1500 ohm resistor and 0.15  $\mu$  F capacitor.
- 5.4 Move the resistor connection to each exposed metallic part and measure the voltage.
- 5.5 Reverse the polarity of the AC plug in the AC outlet and repeat the above measurement.
- 5.6 Voltage measured must not exceed 7.5 volt RMS, from any exposed metallic part to ground. A leakage current tester may be used in the above hot check, in which case any current measured must not exceed 5.0 milliamps. In the case of a measurement exceeding the 5.0 milliamp value, a rework is required to eliminate the chance of a shock hazard.

### Note:

High voltage is present when this CRT display is operating. Always discharge the anode of the picture tube to the display chassis to prevent shock hazard.

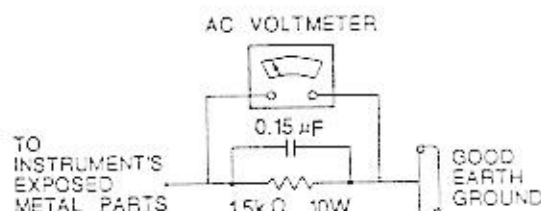


Figure. 1

## 6. IMPLOSION PROTECTION

All picture tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only replacement picture tubes.

## 7. X-RADIATION

**WARNING:** The only potential source of X-Radiation is the picture tube. However, when the high voltage circuitry is operating properly there is no possibility of X-Radiation problem. To ensure that this is the case the high voltage must be tested and maintained at the following factory recommended levels.

**Note:** It is important to use an accurate, periodically calibrated, high voltage meter.

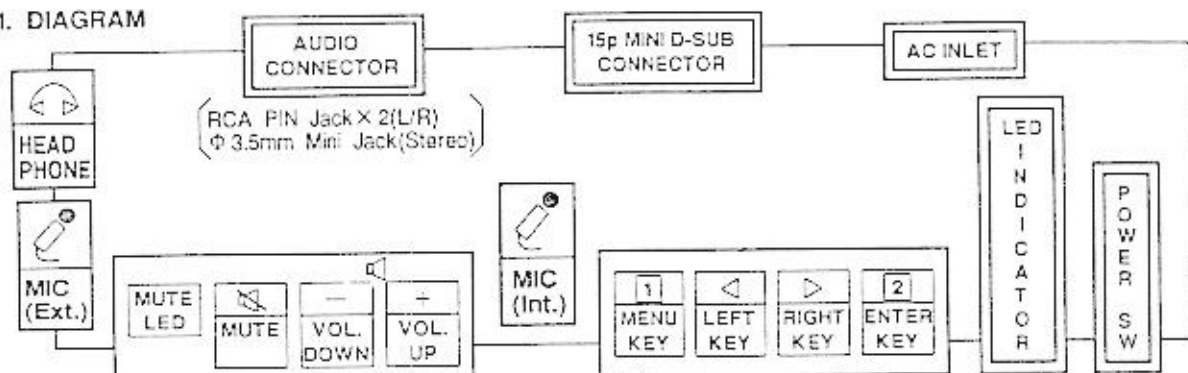
- 7-1 The procedure for adjusting the high voltage is shown on page 12.
- 7-2 If the high voltage cannot be adjusted to 25.0 KV, immediate service is required.
- 7-3 To prevent X-Radiation possibility it is essential to use the specified picture tube.

**IMPORTANT SAFETY NOTICE**

There are special components used in this CRT that are important for safety. These parts are identified by the international symbol  $\Delta$  on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacture's specified parts to prevent X-RADIATION, shock, fire or other hazards. Do not modify the original design without written permission of the ViewSonic Corp. Company or this will void the original parts and labor guarantee.

# SPECIFICATION

## 1. DIAGRAM



- 1.1 POWER SW., LED, [MENU] key (MENU), [LEFT] key (LEFT), [RIGHT] key (RIGHT), [ENTER] key, Audio Volume Up/Down key, Mute-key and Mute LED are located on the front panel.
- 1.2 Signal cable and AC inlet are located on the back side of the cabinet.
- 1.3 OSD menu includes the following function.  
CONTRAST, BRIGHTNESS, H/V SIZE, H/V POSITION, V. PINCUSHION, TRAPEZOID, PARALLELOGRAM, COLOR SELECT, USER COLOR, VIDEO INPUT LEVEL, DISPLAY FREQUENCY, RECALL, AUDIO LEVEL, LANGUAGE.  
\*) CONTRAST can be directly controlled with [LEFT]/[RIGHT] key.  
\*) With sync. signal, OSD menu appears by pushing [MENU] key.  
Without sync. signal, self test menu appears by pushing [MENU] key.  
\*) AUDIO LEVEL can be directly controlled with VOL UP/DOWN-key.

## 2. MECHANICAL SPECIFICATIONS

..... refer to the attached drawing

### 2.1 Dimensions

Height:	: 15.1 in. (383 mm)
Width:	: 14.7 in. (374 mm)
Depth:	: 16.0 in. (407 mm)

### 2.2 Net Weight:

	: 15.0 kg (33.0 lbs)
--	----------------------

## 3. CONNECTORS

### 3.1 Signal connector

Video signal	: 15pin Mini D-Sub
Line Input	: RCA Type pin jack
Mic Output	: $\Phi$ 3.5mm Stereo Mini jack *1
External Microphone	: $\Phi$ 3.5mm Stereo Mini jack
Headphone	: $\Phi$ 3.5mm Stereo Mini jack

\*1 "To connect with sound Card. Please use stereo type cable. If you use monoral type cable, Mic doesn't work correctly."

### 3.2 AC Inlet : CEE 22 typed connector 15P Mini D-Sub Pin assignment

1...RED	6...GROUND	11...GROUND
2...GREEN	7...GROUND	12...SDA
3...BLUE	8...GROUND	13...H.SYNC.
4...GROUND	9...— (OPNN)	14...V.SYNC(VCLK)
5...GROUND	10...GROUND	15...SCL

## 4. CRT SPECIFICATIONS

Part No.	M35KPC000X
Type	15", 90° 29 $\phi$ , in-line gun
Dot Pitch	0.27 mm
Phosphor	R, G, B Short Persistence
Bulb	TINT
Face	New AGRAS Coating
Total Transmission	53.5%

## 5. ELECTRICAL SPECIFICATIONS

### 5.1 STANDARDS CONDITIONS...EXCEPT SPECIAL ITEMS

Display image	Green, full "H" characters with a border line. (7 $\times$ 9 dots) Video Signal: 100% duty
Video signal level	0.7 Vpp
Contrast, Brightness	Contrast: Max., Brightness: Center (50% point)
Ambient Temperature	20 $\pm$ 5°C (68 $\pm$ 9°F)
Input Voltage	AC 120 V, 60 Hz
Terrestrial magnetism	Vertical field: -M: 50 $\mu$ T, -E: -40 $\mu$ T A: 45 $\mu$ T Horizontal field: no field
Viewing direction	Parallel to the CRT axis
Measurements	After an initial warming up time of more than 30 minutes
Ambient light	200 $\pm$ 50 lux
Display mode	1024 $\times$ 768 75Hz

### 5.2 POWER SUPPLY...Commercial power source

Input voltage	AC 90 - 264 V
Power frequency	50/60 Hz $\pm$ 3 Hz
Input current	2.0 A (at AC 100V)
Inrush current (at 20°C)	40A0-p
Power consumption	120W (Typ.)



TIMING CHART

A	Period
B	Blanking
C	Sync Width
D	Back Porch
E	Active
F	Front Porch

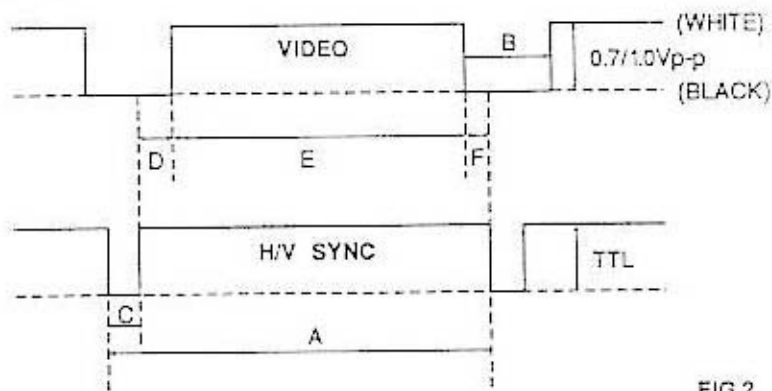


FIG.2

		PRESET			RESERVATION
		MODE-58	MODE-57	MODE-43	MODE-2
		640 X 480 at 75Hz	800 X 600 at 75Hz	1024 X 768 at 75Hz	VGA480 at 70Hz
DOT CLOCK		31.500 MHz	49.500 MHz	78.750 MHz	25.175 MHz
H O R I Z	IH	37.50 KHz	46.88 KHz	60.02 KHz	31.47 KHz
	A-Period	25.667 us (840 dots)	21.333 us (1056 dots)	16.660 us (312 dots)	31.778 us (800 dots)
	B-Blanking	6.349 us (200 dots)	5.172 us (256 dots)	3.657 us (296 dots)	6.356 us (160 dots)
	C-Sync width	2.032 us (64 dots)	1.616 us (80 dots)	1.219 us (96 dots)	3.813 us (96 dots)
	D-Back porch	3.810 us (120 dots)	3.232 us (160 dots)	2.235 us (176 dots)	1.907 us (48 dots)
	E-Active time	20.317 us (640 dots)	16.162 us (800 dots)	13.003 us (1024 dots)	25.423 us (640 dots)
	F-Front porch	0.508 us (16 dots)	0.323 us (16 dots)	0.203 us (16 dots)	0.636 us (16 dots)
V E R T	IV	75.00 Hz	75.00 Hz	75.03 Hz	70.08 Hz
	A-Period	13.333 ms (500 lines)	13.333 ms (625 lines)	13.328 ms (800 lines)	14.268 ms (449 lines)
	B-Blanking	0.533 ms (20 lines)	0.533 ms (25 lines)	0.533 ms (32 lines)	1.557 ms (49 lines)
	C-Sync width	0.050 ms (3 lines)	0.064 ms (3 lines)	0.050 ms (3 lines)	0.064 ms (2 lines)
	D-Back porch	0.427 ms (16 lines)	0.448 ms (21 lines)	0.466 ms (28 lines)	1.112 ms (35 lines)
	E-Active time	12.800 ms (480 lines)	12.800 ms (600 lines)	12.795 ms (768 lines)	12.711 ms (400 lines)
	F-Front porch	0.027 ms (1 lines)	0.021 ms (1 lines)	0.017 ms (1 lines)	0.361 ms (12 lines)
Sync polarity (H/V)		Negative/Negative	Positive/Positive	Positive/Positive	Negative/Positive

		RESERVATION			
		MODE-3	MODE-9	MODE-12	MODE-15
		VGA480 at 60Hz	800 X 600 at 62Hz	1024 X 768 at 60Hz	1280 X 1024 at 60Hz
DOT CLOCK		25.175 MHz	40.000 MHz	65.000 MHz	109.497 MHz
H O R I Z	IH	31.47 KHz	37.68 KHz	48.36 KHz	63.73 KHz
	A-Period	31.778 us (800 dots)	26.400 us (1056 dots)	20.677 us (1344 dots)	15.690 us (1716 dots)
	B-Blanking	6.356 us (160 dots)	6.400 us (256 dots)	4.923 us (320 dots)	4.000 us (438 dots)
	C-Sync width	3.813 us (96 dots)	3.200 us (128 dots)	2.092 us (136 dots)	1.420 us (156 dots)
	D-Back porch	1.907 us (48 dots)	2.200 us (88 dots)	2.462 us (160 dots)	2.174 us (238 dots)
	E-Active time	25.423 us (640 dots)	20.000 us (800 dots)	15.754 us (1024 dots)	11.690 us (1280 dots)
	F-Front porch	0.636 us (16 dots)	1.000 us (40 dots)	0.369 us (24 dots)	0.402 us (44 dots)
V E R T	IV	59.94 Hz	60.32 Hz	60.004 Hz	60.00 Hz
	A-Period	16.684 ms (525 lines)	16.578 ms (628 lines)	16.666 ms (806 lines)	16.663 ms (1052 lines)
	B-Blanking	1.430 ms (45 lines)	0.739 ms (28 lines)	0.786 ms (38 lines)	0.596 ms (38 lines)
	C-Sync width	0.064 ms (2 lines)	0.106 ms (4 lines)	0.124 ms (6 lines)	0.047 ms (3 lines)
	D-Back porch	1.049 ms (33 lines)	0.607 ms (23 lines)	0.600 ms (29 lines)	0.502 ms (32 lines)
	E-Active time	15.254 ms (480 lines)	15.840 ms (600 lines)	15.880 ms (768 lines)	15.067 ms (1024 lines)
	F-Front porch	0.318 ms (10 lines)	0.026 ms (1 lines)	0.052 ms (3 lines)	0.047 ms (3 lines)
Sync polarity (H/V)		Negative/Negative	Positive/Positive	Negative/Negative	Negative/Negative

		RESERVATION			
		-1	-2	-3	-4
DOT CLOCK		22.600 MHz	40.250 MHz	64.040 MHz	93.430 MHz
H O R I Z	IH	29.50 KHz	39.002 KHz	53.997 KHz	69.965 KHz
	A-Period	33.894 us (768 dots)	25.640 us (1032 dots)	19.520 us (1186 dots)	14.298 us (1335 dots)
	B-Blanking	5.400 us (122 dots)	5.140 us (207 dots)	3.900 us (250 dots)	2.900 us (272 dots)
	C-Sync width	4.115 us (93 dots)	2.932 us (114 dots)	1.718 us (110 dots)	1.092 us (102 dots)
	D-Back porch	1.283 us (29 dots)	2.311 us (93 dots)	2.186 us (140 dots)	1.820 us (170 dots)
	E-Active time	27.876 us (630 dots)	19.901 us (804 dots)	14.007 us (897 dots)	10.960 us (1024 dots)
	F-Front porch	0.620 us (14 dots)	0.600 us (24 dots)	0.600 us (38 dots)	0.410 us (39 dots)
V E R T	IV	49.05 Hz	77.079 Hz	105.053 Hz	165.059 Hz
	A-Period	20.815 ms (814 lines)	12.974 ms (506 lines)	9.519 ms (514 lines)	6.058 ms (424 lines)
	B-Blanking	0.914 ms (24 lines)	0.615 ms (24 lines)	0.369 ms (21 lines)	0.366 ms (27 lines)
	C-Sync width	0.102 ms (3 lines)	0.103 ms (5 lines)	0.037 ms (2 lines)	0.043 ms (3 lines)
	D-Back porch	0.712 ms (21 lines)	0.513 ms (20 lines)	0.352 ms (19 lines)	0.343 ms (24 lines)
	E-Active time	19.899 ms (587 lines)	12.239 ms (477 lines)	4.880 ms (488 lines)	5.601 ms (392 lines)
	F-Front porch	0.102 ms (3 lines)	0.128 ms (5 lines)	0.093 ms (5 lines)	0.071 ms (5 lines)
Sync polarity (H/V)		Negative/Negative	Positive/Positive	Negative/Negative	Negative/Negative

## 5.4 Acceptable timing

- If your timing is within the following specification, this CRT display can automatically function with a certain size and position.

Horizontal: Sync frequency: 30.0 ~ 69.0 kHz

Blanking Time:  $\geq 4.0 \mu\text{s}$

Back Proch:  $\geq 1.25 \mu\text{s}$

Front Proch:  $\leq$  Back Proch

Sync Width:  $\geq 1.2 \mu\text{s}$

Vertical: Sync frequency: 50.0 ~ 160.0 Hz

Blanking Time:  $\geq 0.5 \text{ ms}$

Back Proch:  $\geq 0.4 \text{ ms}$

Sync Width:  $\geq 0.045 \text{ ms}$

- In case of size and/or position is not appropriate, please adjust it as you like through OSD menu, and if you want to keep it (size and position), please push the key for memory.

Please notice, however, that there is the case you can not get the size and/or position you want, (for example Display Time is too short like MAC-II (832 X 624) timing, then you can't get bigger size of the image.)

- The CRT adopted in this CRT display is designed to minimize the moire phenomenon at suitable size for typical display modes. However, there might be a display format among many formats, in which the moire phenomenon appears on this display. In such case, please adjust the height and/or width until the moire disappears.

## 5.5 Signal level and input impedance

### 5.5.1 Video signal level

This CRT display is adjusted at the factory using 0.7 Vp-p Video Signal, Black level is 0V.

### 5.5.2 Sync Signal level

- H/V Separate, H/V Mixed: TTL level
- Sync on Green: 0.266 Vpp

### 5.5.3 Audio Signal level

- Maximum audio input level is 2.0Vrms (f: 1kHz, sine wave; to present signal saturation at pre-amplifier stage.)
- Note: This CRT display is designed that the Sound microphony on image is not visible less than 0.5Vrms audio input level. If the sound microphony appears, please reduce audio output level by Audio Volume Key.

### 5.5.4 Input impedance

- Video input: 75  $\Omega$
- Sync input:  $\geq 1 \text{ k}\Omega$

## 5.6 Display performance (for preset timing)

### 5.6.1 Display area

#### a) 3 Preset mode

640 X 480, 800 X 600, { WIDTH: 260 mm  $\pm$  5 mm  
1024 X 768 { HEIGHT: 195 mm  $\pm$  5 mm

#### b) 5 Reservation mode

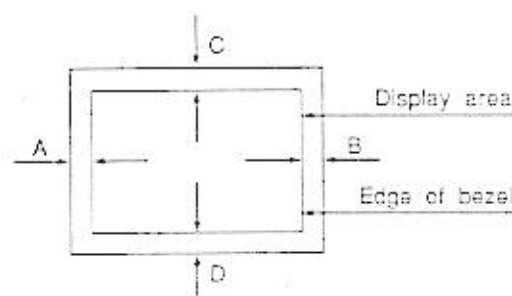
640 X 400, 640 X 480, { WIDTH: 260 mm  $\pm$  7 mm  
800 X 600, 1024 X 768 { HEIGHT: 195 mm  $\pm$  7 mm  
1024 X 1280 { WIDTH: 244 mm  $\pm$  5 mm  
{ HEIGHT: 195 mm  $\pm$  5 mm

### 5.6.2 Centering

#### 3 Preset mode

| A-B |  $\leq 5 \text{ mm}$

| C-D |  $\leq 5 \text{ mm}$



### 5.6.3 Distortion

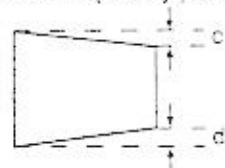
#### a) Trapezoid, Parallelogram & Rotation

| a |, | b |  $\leq 2.5 \text{ mm}$  (factory preset)  
| a |, | b |  $\leq 1.5 \text{ mm}$  (user adjustable)



| c |  $\leq 1.5 \text{ mm}$  (factory preset)

| d |  $\leq 1.5 \text{ mm}$  (factory preset)



#### b) Pincushion and Barrel

| c1 |, | c2 |  $\leq 2.0 \text{ mm}$   
| d1 |, | d2 |  $\leq 2.0 \text{ mm}$  (factory preset)  
1.5 mm (user adjustable)

